A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY

July 23, 1953

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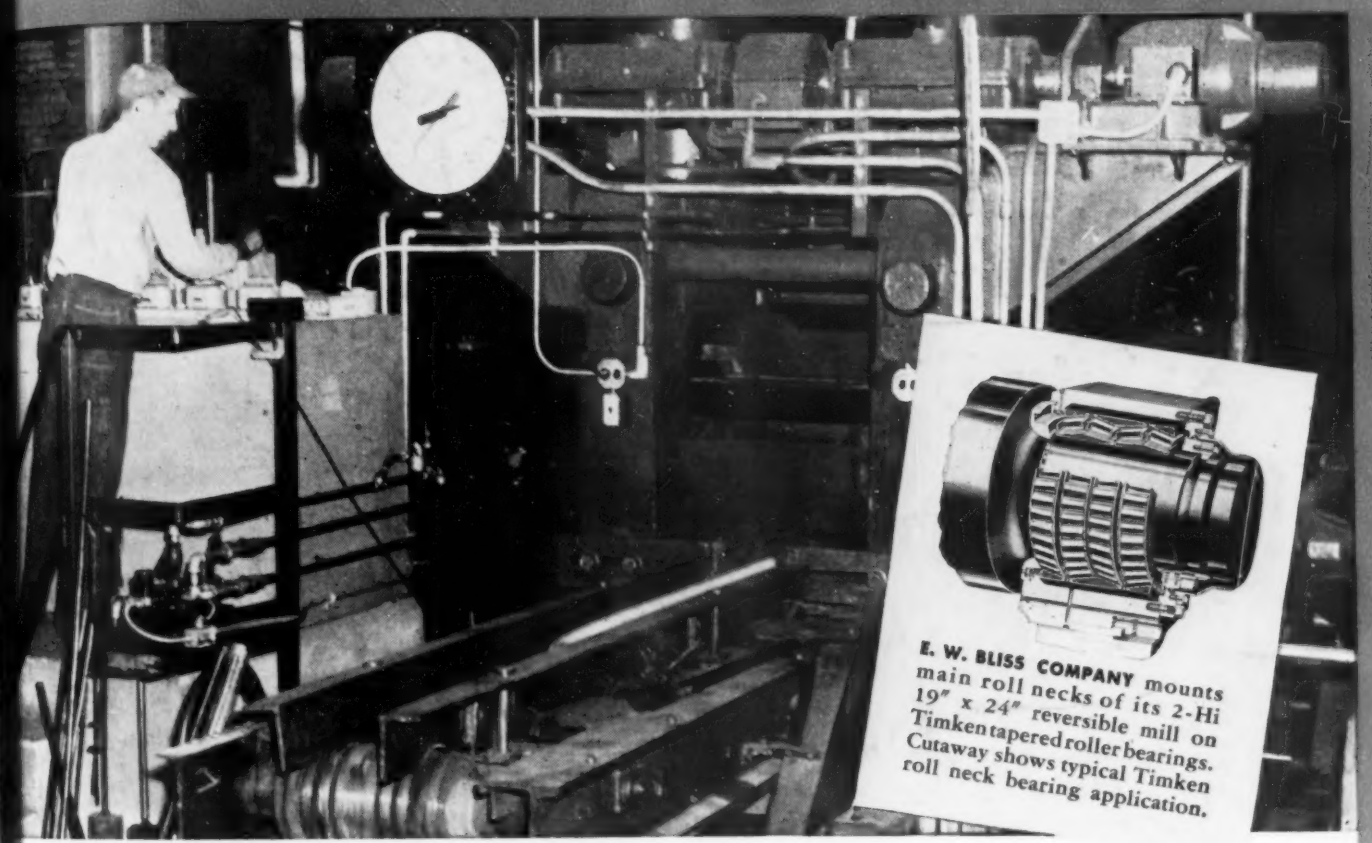


E. W. BLISS COMPANY mounts main roll necks of its 2-Hi 19″ x 24″ reversible mill on Timken tapered roller bearings. Cutaway shows typical Timken roll neck bearing application.

Hot rolls 5″ square stock, holds ±0.005″ tolerances with TIMKEN® bearings

BLISS engineers were faced with the problem of handling severe loads set up as 5″ square stock is hot rolled to 3⅜″ in just six passes. After careful study, Timken® bearings were selected for the main roll necks as well as worm, bevel, high and slow speed shafts of their 2-Hi reversible mill.

Higher rolling mill speeds are possible on Timken roll neck bearings. Lower starting resistance of Timken bearings permits mills to accelerate more rapidly. Skidding between work roll and back-up roll is reduced.

By permitting the use of simple and economical grease lubrication, Timken bearings eliminate complicated lubrication systems. Rolls can be changed quickly and easily.

No special thrust bearings are needed because Timken tapered roller bearings take radial and thrust loads in any combination. And Timken bearings can take the heaviest of loads. Line contact between their rollers and races gives Timken bearings load-carrying capacity to spare.

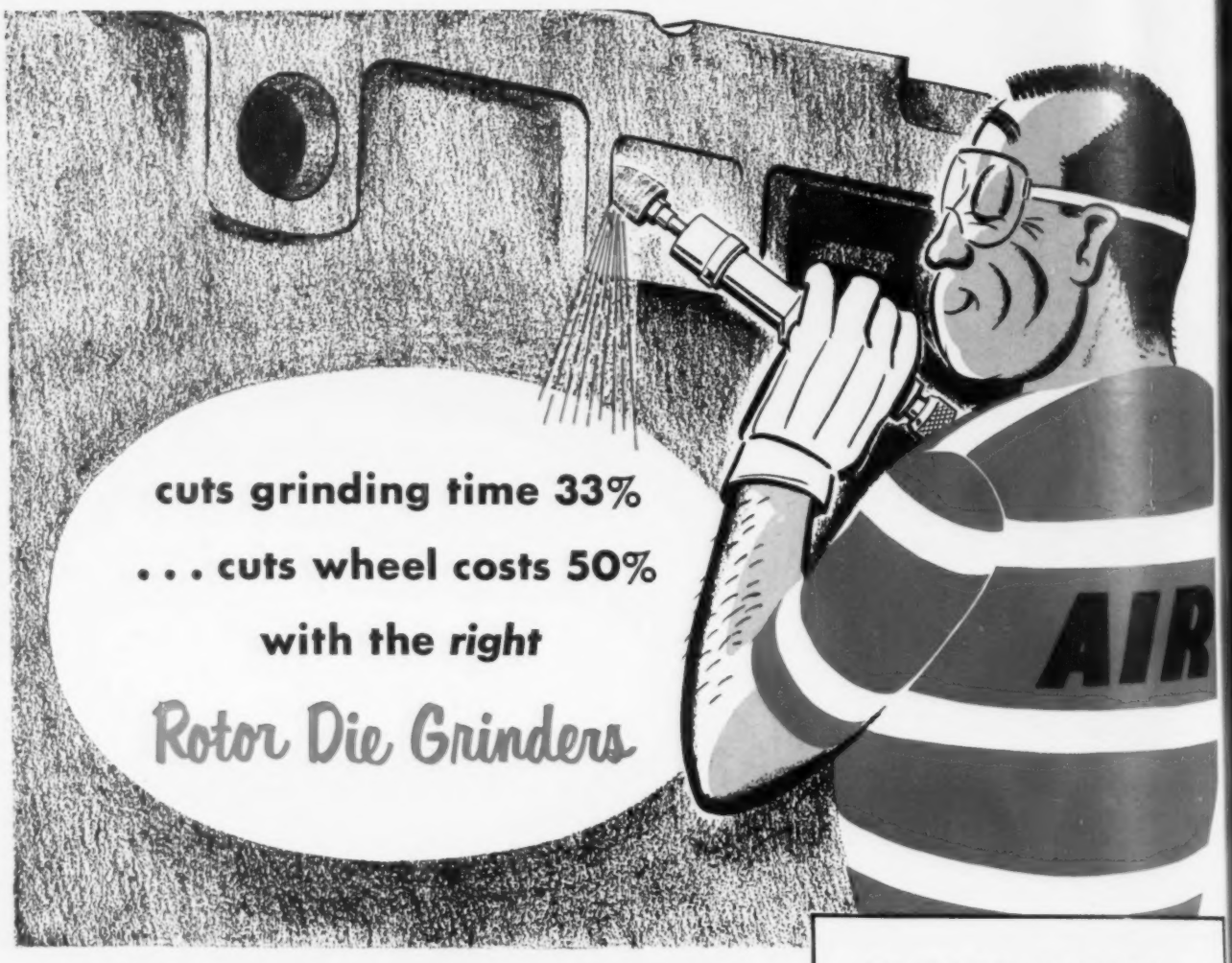
Why not get all the advantages of Timken bearings in *your* mills? For complete information, consult our roll neck specialists. Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION



HERE'S how Rotor Tool engineering assistance helped a New England manufacturer of large machine tools:

PROBLEM: Getting into recesses, corners, contours in large machine tool castings of high carbon steel. Finish was important. Used large cone wheels at 6000 R.P.M. Average weight of grinders was 12 to 13 lbs. Hard to control on small contours.

SOLUTION: Rotor Application Engineer recommended Rotor M-871 Short Spindle Die Grinder at 17,000 R.P.M., using small cone wheels. Tool weight is only 4 lbs. 10 oz., permitting faster, easier handling.

RESULTS: High-speed, light-weight Rotor Grinders have cut grinding time 33%. Saves 50% in wheel costs. Cut operator fatigue.

Rotor Application Engineers can demonstrate savings on *your* job. Write for Catalog No. 38.

AIR O'TOOL

281 ROTOR MODELS...

The right grinder for your job!

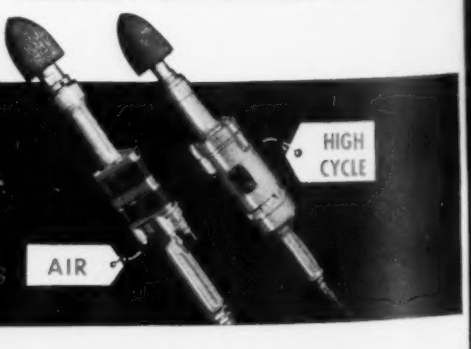
SPEEDS...21,000; 20,000; 17,000; 12,000 and 8,000 R.P.M.

COLLETS...¼"—⅛"—$\frac{1}{16}$"—½" (for abrasive sticks)

WHEEL ARBORS...For wheels ½" and $\frac{3}{16}$" in thickness, cone wheel adapters—also extensions.

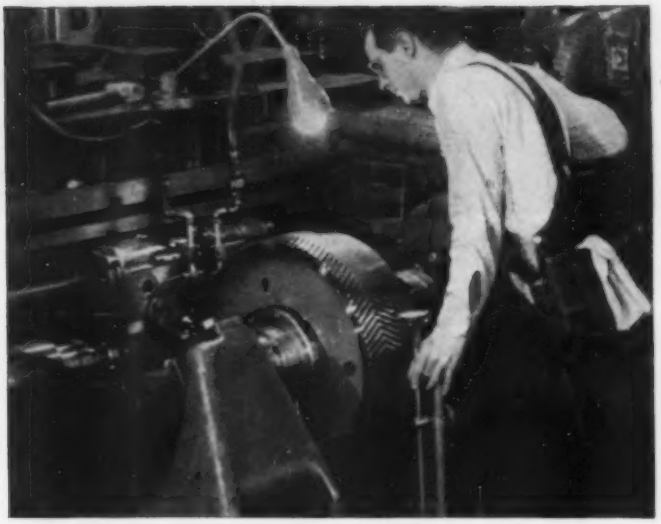
SPINDLES . . . Short and long spindles.

HANDLES...Lever, twist, snap and sleeve.

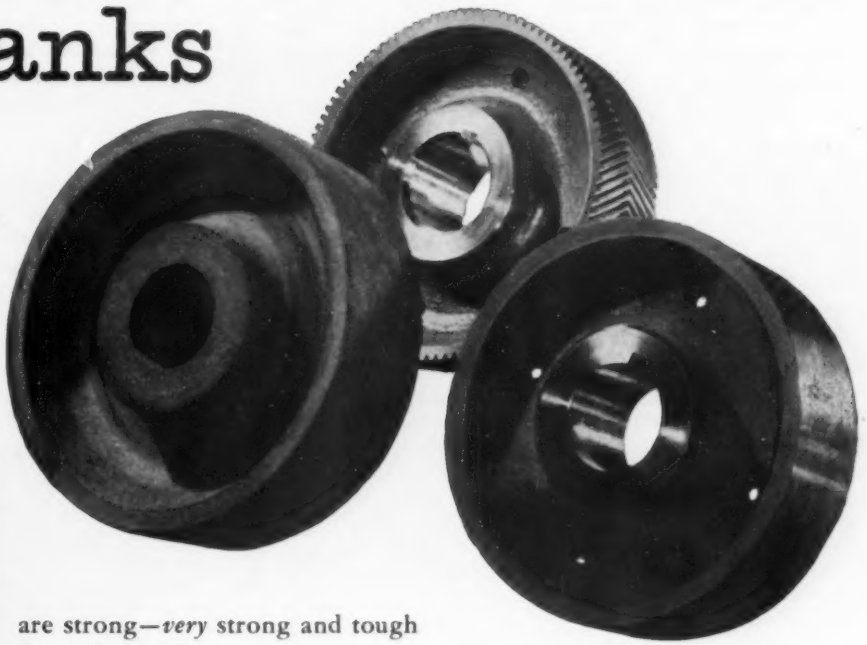


THE ROTOR TOOL CO.
CLEVELAND, OHIO

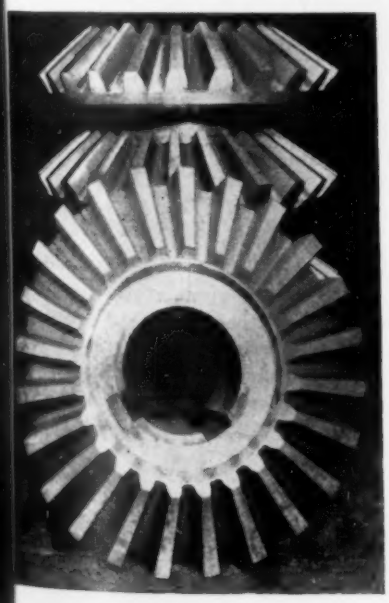
UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



Facts about some very strong gear blanks



Bethlehem makes gear blanks by a special process involving both forging and rolling—a process resulting in uniform density of metal and excellent grain flow. Because of the firm, solid steel all the way through, the blanks machine dependably and easily, with no hidden trouble down beneath. And they are strong—*very* strong and tough from rim to rim.



They are made in the only mill of its kind in the world. Available heat-treated or untreated, these sturdy Bethlehem blanks are unsurpassed for spur, bevel, miter, herringbone, and other types of gears. And you can get them in a wide range of sizes—approximately 10 to 42 in. OD.

Care for more details? We'll gladly furnish all you want . . . together with helpful Booklet 216, which is yours for the asking.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-and-FORGED CIRCULAR PRODUCTS

The Iron Age

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DIGEST of

NEWS DEVELOPMENTS

INSTALL YODER NONFERROUS TUBING MILL—P. 53
First Yoder mill should start producing thin wall nonferrous tubing at Bridgeport Brass next month. Other firms are installing similar equipment. Tubing may be produced at 40 to 120 fpm. Much market development work needs to be done but the potential market for this type tubing is believed to be as broad as costs are low.

VIDEO PROGRAM'S SHOWPLACE OF INVENTIONS—P. 54
If you are one of the many thousands of Americans with a flair for gadgetry, you have spent countless hours in your home workshop trying to rig up that "better mousetrap". Much of your creative thinking has been in a dead end because you lacked liaison with industry. A TV program thinks it has the answer.

MANPOWER SUPPLY TRAILS MOUNTING DEMAND—P. 57
Level of skilled personnel is lagging behind the ever increasing demands of our technically expanding economy. Manpower committee says industry is not making best use of available working force. Suggest revised thinking on draft, college training. Russia is pressing to close skilled worker gap.

EXPLORE AFRICAN MANGANESE DISCOVERY — P. 58
U. S. Steel Corp. is 49 pct owner of French Equatorial African manganese lode. French say it may hold 50 million tons—but it will take years to prove it. Quality is said to compare with Russian ore that no longer comes to U. S. Site is 250 miles from coast. Rivers may, or may not, be navigable.

AUSTRIANS HIGH ON OXYGEN STEEL PROCESS—P. 63
Austria's Linz iron and steelworks, one of the first to use the oxygen steelmaking method, finds the process is producing better steel economically. Indications are that this modified Bessemer method may be the solution to Austria's steel expansion problem. Details on how oxygen steel is produced.

BOOM AND BUST COME TOGETHER IN DETROIT—P. 68
Part of the auto industry is running overtime, talking about even higher production while other firms are laying off workers. Defense cutbacks hurt, and more than 13,000 Kaiser workers were laid off when the Air Force cancelled plane contracts. But most have found new employment. Big producers fight for markets.

the Week in Metalworking

ENGINEERING & PRODUCTION

HOW ONE FIRM FABRICATES BRITTLE TITANIUM—P. 111
Brittleness in titanium and its alloys stands as a major obstacle to wider titanium application. Proper use of heat is a big help in overcoming the metal's poor forming qualities. Drop forge blanks can be press sheared without shattering by using an induction coil to heat bar stock.

WEIGHT VARIATIONS IN CARLOADS OF SCRAP—P. 116
Two out of every three cars of iron and steel scrap are short 700 lb net when shippers use railroad car weights. The 500 lb tolerance took care of only a third of the cars covered in this study. Major cause of shortage is unreliability of the marked tare weight. Mill weights have been proved most reliable.

COPYING LATHE LICKS SHORT RUN TURNING—P. 120
Heavy metal removal, close Air Force tolerances and difficult contours presented a turning problem to Jacobs Aircraft Engine Co. in its production of short run aircraft parts. A hydraulic copying lathe, with quick setup features, proved ideal for short runs of intricate parts as well as for long run production.

COMPLEX PART SUCCESSFULLY SHELL MOLDED—P. 124
Shell molding has replaced machining in making diffuser disks, a complex aluminum part for a new gas-turbine engine. The big diffuser disks, 17 in. in diam, are poured in a horizontal plane. As-cast surface finish is close to 32 microinches rms. Parts are cast from SAE 323 aluminum alloy. Pouring temperature is 2150° F.

NEXT WEEK—METHOD QUADRUPLES WELDING SPEEDS
Semiautomatic hidden arcwelding methods are combined with welding positioners and turning rolls to step up welding speed and improve quality in this novel welding operation. Results of the changeover from hand to semiautomatic welding are less warpage and distortion, better welds, better working conditions.

NEXT WEEK—PLAN SAFETY FOR BETTER PRODUCTION
Safety can be built into a plant and its machinery and tools. It takes plenty of planning and is everyone's job. Here's the story of a plant—now holding its ninth safety award—which has done an outstanding job in reducing lost time accidents and lowering accident severity rates. Employees suggested many valuable ideas.

MARKETS & PRICES

ARE HEAT PUMPS THE NEXT APPLIANCE BOOM?—P. 51
The century-old principle of the heat pump is getting new attention now that GE and Westinghouse are marketing packaged air units. Competitors favor water as a heat source. Costs are starting to compete with fuel-burning units. See yearly sales of 200,000 units at under $2000 by 1960. Housing may be much altered.

BETHLEHEM BOOSTS STRUCTURAL CAPACITY—P. 55
Bethlehem Steel is planning a $30 million expansion and modernization program for its structural mills. Steel producers have been apathetic for some time about adding more structural capacity, but may now be changing their minds. Other producers now favor more structural capacity. Wide flange beams are tightest.

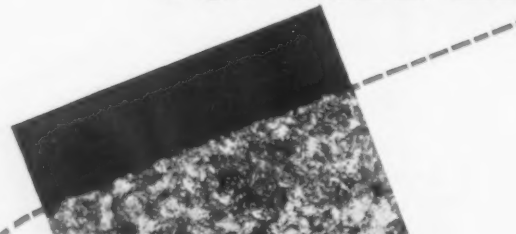
SOIL PIPE RACE IS HYPO TO OLD INDUSTRY—P. 62
Competition from new materials has provided stimulus to cast iron soil pipe industry. Start vigorous battle to regain losses. Cast Iron Soil Pipe Institute sponsors research program, establishes new industry-wide standards, aims at educating public in advantages of its product. Result: A stronger industry.

POSTWAR MACHINERY EXPORT MARKET SHIFTS—P. 79
Major export market for U. S. capital goods has shifted from Europe to Latin America and Canada. South America currently has the lead as largest buyer, but the Dominion is overtaking it rapidly. Europe is maintaining its position as the best customer of U. S. machine tools and other metalworking equipment.

BUSINESS REPORT TO MANAGEMENT BOWS IN—P. 81
This week's issue introduces Report to Management, discussion and interpretation of production facts and figures. Gist of the current page is the effect of active but orderly competition on inflationary forces. They are being kept passive while a mild deflation has taken hold on the pricing front.

FOURTH QUARTER STEEL DEMAND HEATS UP—P. 133
A lot of people are raising their sights on demand for steel in the second half. At the rate fourth quarter books are filling up it doesn't shape up as a slacking off period. Some producers are frankly amazed at the continuing demand. Only a rash of cancellations could knock the ingot rate by more than a few points.

SCALE FREE—DECARB FREE **Hardening for ALL Engineering Steels**



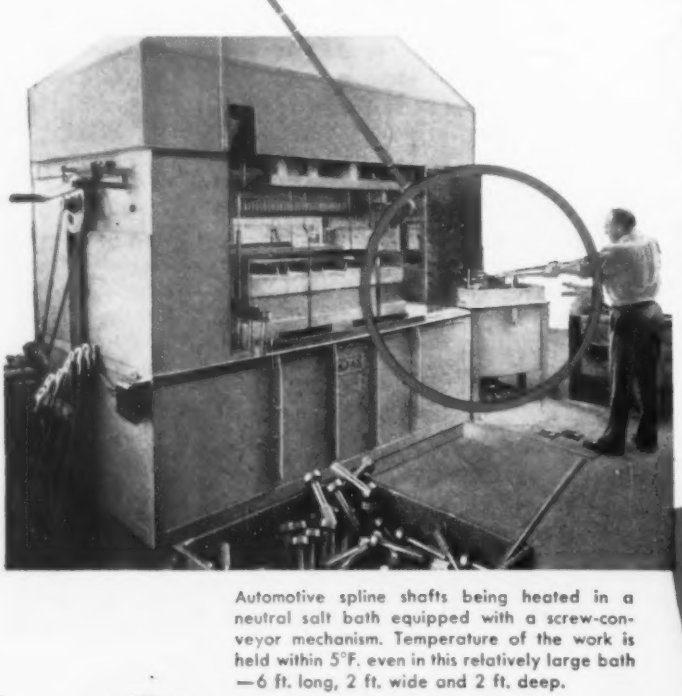
Photomicrograph showing absence of scale or decarburization in a section of S.A.E. 1085 steel (X100) neutral salt bath hardened at 1500°F. and quenched in oil. (Etched in 2% Nital.)

By its very nature the Ajax Electric Salt Bath Furnace guards against pitting, scaling, carburizing or decarburizing in the hardening of carbon, alloy, stainless and high carbon-high chromium steels in the temperature range from 1450° F. to 1950° F. The liquid neutral salt bath not only prevents these surface effects by sealing the work from air during heating, but leaves a protective film of salt on it right up to the moment of quenching. All need for "protective atmospheres," gas generating equipment and specially trained operators is eliminated.

Heating cycles are from 4 to 6 times faster than in atmosphere or radiant type furnaces, thus enabling small, relatively inexpensive salt bath equipment to handle an amazing volume of work. Heat is transferred by conduction rather than by convection or radiation, all surfaces of the work being in direct contact with the molten salt. Heating is extremely rapid and uniform. Distortion is reduced to a negligible minimum.

The unique internal heating principle of the Ajax furnace produces an automatic electrodynamic stirring action which contributes to rapid heating and assures a temperature variation of *less than* 5° F. throughout the bath.

Ajax furnaces assure low operating and maintenance costs and no skilled labor is required. Ceramic pots last 5 years or longer (many are still in use after 8 years continuous service).



Automotive spline shafts being heated in a neutral salt bath equipped with a screw-conveyor mechanism. Temperature of the work is held within 5°F. even in this relatively large bath —6 ft. long, 2 ft. wide and 2 ft. deep.

AJAX ELECTRIC COMPANY, Inc.

WORLD'S LARGEST MANUFACTURER OF ELECTRIC HEAT TREATING FURNACES EXCLUSIVELY

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THE IRON AGE

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National Business Publications

Be Your Own Expert

THIS is the age of experts. Lectures, books and speeches tell us about everything in and out of business. This is the age of figures and statistics. They help us in trying to map production programs, sales bogies and potential markets.

We pay heed to those who are supposed to know what is going on in their own field. This is fine—if these authorities know what they are talking about; if they are fair in explaining the limitations of their crystal balls.

What about the experts who more than a year ago—yes, 3 years ago—said we were in for a big depression? We know they didn't know what they were talking about. Let's skip all the reasons and excuses as to why they were wrong. They were wrong.

Joe Livingston, an able syndicated business column writer, found that the experts were wrong two thirds of the time in their predictions that a significant fall in business activity was coming. They erred more than you would if you had just guessed.

The purge of Beria, Soviet bigwig, came as a complete surprise and shock to all the experts—here and abroad. Admittedly most people knew that sooner or later one of the Russian leaders would be liquidated. Even today top level experts disagree on who will be next.

This is no indictment of those who have not guessed correctly on future events. No one can do this with fine accuracy. But it seems clear that you should not let the experts control your judgment too much when it comes to running your company's business—and your own.

It is good to be informed. It is good to harken to the experts. But it is good to remember that any plan or action for the future must contain a calculated risk—a gamble—imagination, intuition, enthusiasm and support.

We need these characteristics more than ever now. Look over the future potential of your country and your company. Consult all the experts you care to; make up your own mind, then act and work for the best. You will come out all right—far better than if you sat on your hands waiting for a miracle to do what you ought to be doing.

Be your own expert!

Tom Campbell

Editor

Piasecki

H-21 TRANSPORT HELICOPTER

MONORAIL Gives Helicopter FIRST LIFT

AMERICAN MONORAIL CRANES HELP ASSEMBLE THE FAMOUS PIASECKI H-21 WORKHORSE

Covering over 600,000 square feet of operating area in the Piasecki plant, American MonoRail Cranes aid in the assembly of these remarkably efficient helicopters. Overhead handling assures safe and accurate movement of parts into assembly with maximum speed. American MonoRail engineers are experienced in all phases of "up and over" handling. They are available for free consultation at your convenience.

Write for our C-1 Bulletin.

THE AMERICAN MONORAIL COMPANY

13103 ATHENS AVENUE **CLEVELAND 7, OHIO**

Dear Editor:

Letters from readers

Summer Checkup

Sir:

I have just read your editorial, "Summer Checkup," in the June 25 issue. I enjoyed it very much. It is refreshing indeed to find in a magazine like yours some attention given to the simpler more basic things in life.

F. A. LEWIS

Dudley, Anderson & Yutzy
New York

Ultrasonic Testing

Sir:

There is an item on p. 69 of the July 9 issue which concerns using a liquid searching unit in place of other piezoelectric materials.

Will you kindly supply us with more information, as we are very much interested in ultrasonic testing equipment.

L. M. McPHARLIN
Chief Gage Engineer

Propeller Div.
Curtiss-Wright Corp.
Caldwell, N. J.

A detailed article entitled "Ultrasonic Testing Improved With Use of Liquid Coupling" will appear in our Aug. 6 issue.—Ed.

Size Tester

Sir:

On the Newsfront page of the July 2 issue the third item mentions that particle size distribution of powdered materials can be analyzed in a fraction of the time and much more accurately with a new laboratory instrument.

Can you tell us who the manufacturer of the particle size classifier is?

J. TOTH
Secretary

Harry W. Dietert Co.
Detroit

Contact the Research Laboratory of Sharples Corp., 201 Spring Garden, Philadelphia, Pa., for more information.—Ed.

New Carbide Tool

Sir:

Referring to your July 2 issue, p. 69, mention is made that better impact resistance and good life under heavy rough turning operations are claimed for a carbide cutting tip now being tried experimentally.

Should be glad to have further information on the subject.

W. W. McKAIG

Cumberland Steel Co.
Cumberland, Md.

Contact Adamas Carbide Corp., 1000 S. 4th St., Harrison, N. J., for more details.—Ed.

Electrical Weighing

Sir:

On p. 51 of your June 11 issue you have the following comment:

"Widespread use of electrical weighing will reduce costs and make pouring of molten metal a scientifically exact procedure. Use of electrical 'load cells' in some openhearth departments has already eliminated monthly bookkeeping tonnage headaches."

Do you have available or do you know where there is available any further information on this subject?

J. G. SHEPPARD
Asst. to Vice-President

Dominion Foundries & Steel Ltd.
Hamilton, Ont.

Further information on electrical weighing may be obtained from Republic Steel Corp., 1405 Republic Bldg., Cleveland, Ohio.—Ed.

All In One

Sir:

In your June 25 issue, p. 63, there is an item concerning only one operation needed to determine carbon and sulfur contents in ferrous alloys using a recently developed procedure.

At the present time we are very much interested in such a method and would appreciate if you could give us any more information on the subject.

D. J. REGAN

Chem-Metal Laboratory
Whirlpool Corp.
St. Joseph, Mich.

More details may be obtained from the Laboratory Div., Lindberg Engineering Co., 2450 W. Hubbard St., Chicago, Ill., who introduced the procedure.—Ed.

Zirconium Boride

Sir:

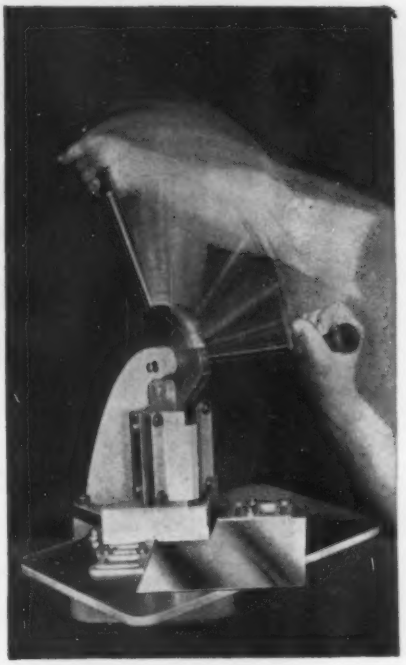
In the June 25 issue, p. 63, there appears an item about zirconium boride and a similar family of cermets developed for high temperature structural use which have been found to have good possibilities as cutting tool materials.

We would like to know where this particular grade of steel is obtainable.

I. C. FRIEDMAN

Federal Auto Products Co., Inc.
Chicago

Further information about zirconium boride and where it may be obtained may be had by contacting Dr. Paul Schwarzkopf, American Electro Metal Corp., 320 Yonkers Ave., Yonkers, N. Y.—Ed.



Notching Sheet Materials?

Do It Quickly, Easily with a DI-ACRO* NOTCHER

Speed up notching operations, eliminate the need for heavy presses and dies with a Di-Acro Notcher. A 6"x6" notch can be made in 16 gauge material in one operation. Many straight shearing jobs also performed.

*pronounced DIE-ACK-RO

BOTH HAND AND POWER OPERATED MODELS AVAILABLE

Di-Acro Power Notcher is especially designed for operations where high rate of production must be maintained. Motor driven flywheel and all moving parts housed in welded, steel cabinet.

Hand operated Di-Acro Notcher is ideal for short run production or experimental use.

WANT MORE INFORMATION?

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Since 1879 "Forgings by Finkl" and die blocks for "Impressions that Last" have been quality products at lowest cost to you. When planning die block and forging requirements we invite you to call on our experienced men and modern facilities.

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ELECTRIC FURNACE STEELS • DIE BLOCKS • FORGINGS

Fatigue Cracks

by William M. Coffey

Our Mr. Coffey slipped on an onion last week, fracturing his French at the surgical neck of the humerus. Unfortunately for regular readers of this column it is not a serious injury and he will return in a week or so. Meanwhile this spot will be filled by ET AL, with an assist from the YUCCA KID.

First, we'd like to present the only extant picture of William M. (for Murgatroyd) Coffey. He's the bashful type so our staff artist had to do a fast job:

Exercisers Anonymous

Most of us like to pretend we do a lot less work around the house than we really do. How many will readily admit to doing the dishes? (Thank you M. Rounderriere[1] for one honest admission). William M. (for Murgatroyd[2]) Coffey is no exception.

For while he hands out all this balderdash about Exercisers Anonymous the plain fact is that he has not been able to get out of cutting the acre of grass around his snug surburban villa.[3] He starts briskly enough with ten fast pulls on the power motor starter rope, finally figures out which way is "in" and "out" on the choke, and cuts the living geewhillikers out of 0.333 acre in the first 1.5 hours.

This notable accomplishment calls for assuming the position of Exercisers Anonymous, partaking of a little harmless refreshment and restudying the thing. The second pause occurs 1.0 hours later, the third after another 0.75 hours. This ungeometric progression continues until dusk is settling over the old manse.[3]

One thing he *has* done: He's rid himself of his boat, prefers to watch other skippers scrape and paint. Promotion Manager Jim Crites is in the latter group. Jim hopes to get his craft into the water any week now. He's been having trouble getting his varnish into the refrigerator; his wife keeps the darn thing cluttered up with food. Well, we think it's nice to get one's boat in the water at least a week or so before taking it out time.

References

Not the kind you have to get to join the club you can't afford to pay for but the kind technical fellows need for deep delving. We've put a few in here[4] to give this page a little class. Once we put about 48 in a technical article, ended up with a little note in 6-point type (this is 8-point) saying readers could have complete references if they wanted 'em. Well, some 31 came back with letters asking for the full treatment. Bon.[1]

Report to Management

Assistant News Editor Ted Metaxas shares with Art Director Carl Cerminaro the distinction of having no middle initial.[5] (The problem was solved in UN fashion by spelling out Ted's first name on the masthead and using the initial on his byline). He has another distinction: He can cut copy, slash, re-write and interpret until it's down to bare facts—clear, simple, easy to read. For weeks now he's been heading up a project to tap major sources of business trend information, boil it down and report its significance. Then the staff goes over it with the usual critico-cynical eye. It has even been set in type on a dry-run basis, just to check appearance. You can see the results this week as a brand new page in the news section following "Machine Tool High Spots."

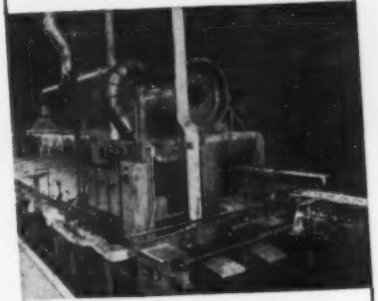
Puzzlers

A farmer wants to run a wire from his house to the power line on a road and thence to the barn, using the shortest length of wire. The house is ten feet from the road, while the barn is 20 feet from the road. The perpendicular distance between the house and barn (between line centers) is 50 ft. Find where the farmer should tie into the power line. (Ignore possible electrocution; also the fact that the power company will not allow the farmer to do the work himself).

[1] French.
[2] Opus cit.
[3] Also over the old man.
[4] Ibid.
[5] NMI, as they say in the Army.

productive
WASHER
installation
#2796

INSTALLATION #2796
FORD



Metalwash Conveyor Washer, one of two in series, performing final wash before engine assembly at FORD MOTOR COMPANY ENGINE PLANT, CLEVELAND, OHIO.

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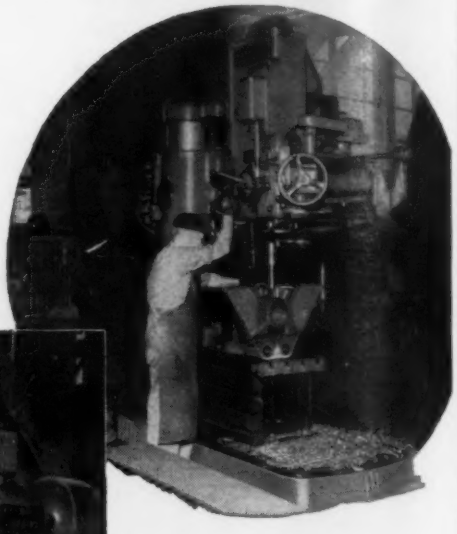
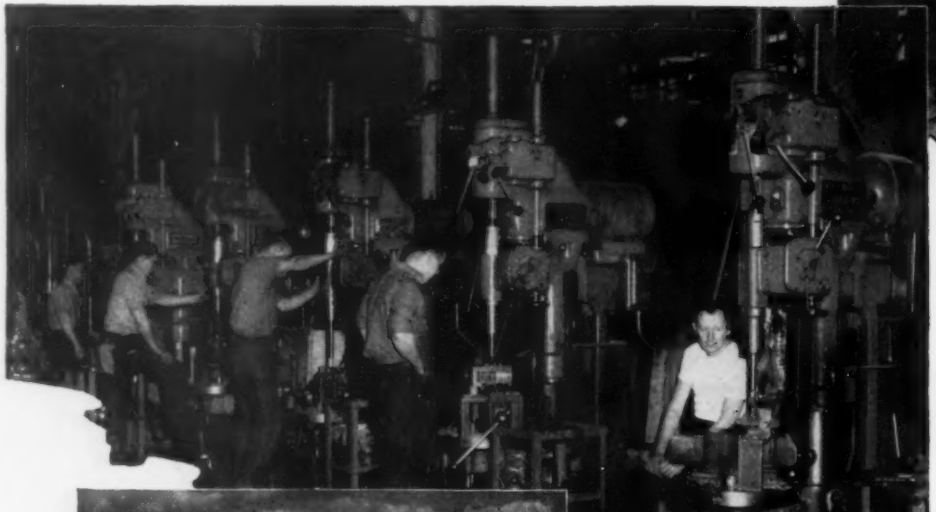
REPRESENTATIVES IN PRINCIPAL CITIES.

It's CINCINNATI BICKFORD at Bay City Shovels, Inc.





Cincinnati Bickford Super Service Radial drilling equalizer support for torque rods and rocker arms.

Photos courtesy —
Bay City Shovels, Inc., Bay City, Michigan

25 years ago Bay City Shovels, Inc., bought its first Cincinnati Bickford Drill. Today high speed drilling in tough alloy steels—(in the manufacture of sturdy Bay City Shovels) is being done by a battery of eleven Cincinnati Bickford Radials and upright Drills. For example, one of these Super Service Radial Drills has increased production on power crane and shovel revolving bases by cutting floor to floor time from 6½ hours to 4¼ hours. Production of the smaller parts is being speeded by the all-geared upright drills.

Write for Bulletins covering Radial and Upright Drills.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

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Dates to Remember

Meetings

JULY

TRUCK TRAILER MANUFACTURERS ASSN.—Annual summer meeting, July 23-24, Edgewater Beach Hotel, Chicago. Association headquarters are at 1024 National Press Bldg., Washington.

NATIONAL TOOL & DIE MANUFACTURERS ASSN. — Summer meeting, July 30-Aug. 1, Milwaukee. Association headquarters are at 907 Public Square Bldg., Cleveland.

AUGUST

WESTERN ELECTRONIC SHOW & CONVENTION—Aug. 19-21, Civic Auditorium, San Francisco. Headquarters are at 1355 Market St., San Francisco.

EXPOSITIONS

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

NATIONAL AUTOMATIC MERCHANDISING ASSN.—Convention & Exhibit, Aug. 23-26, Conrad Hilton Hotel, Chicago. Association headquarters are at 7 S. Dearborn St., Chicago.

SEPTEMBER

ELECTROCHEMICAL SOCIETY — Fall meeting, Sept. 13-17, Wrightsville Beach, N. C. Society headquarters are at 235 W. 102nd St., New York.

NATIONAL PETROLEUM ASSN. — Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters are at Munsey Bldg., Washington.

NATIONAL FOUNDRY ASSN.—Annual meeting, Sept. 16-18, Plaza Hotel, New York. Association headquarters are at 53 W. Jackson Blvd., Chicago.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE — Annual meeting, Sept. 20-23, Skytop Lodge, Pa. Institute headquarters are at 342 Madison Ave., New York.

TRUCK BODY & EQUIPMENT ASSN., INC.—Sept. 21-23, Sheraton-Gibson Hotel, Cincinnati. Association headquarters are at 1122 Dupont Circle Bldg., Washington.

AMERICAN MINING CONGRESS—Metal and Nonmetallic Mineral Mining Convention, Sept. 21-24, Olympic Hotel, Seattle. Headquarters are at 1200 18th St., Washington.

INSTRUMENT SOCIETY OF AMERICA —National Instrument Conference and Exhibit, Sept. 21-25, Chicago. Society headquarters are at 1319 Allegheny Ave., Pittsburgh.

NATIONAL ASSN. OF FOREMEN—Annual convention, Sept. 23-26, Milwaukee. Association headquarters are at 321 W. First St., Dayton.

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5 THREADING PASSES ELIMINATED By LANDIS Centerless Thread Grinders

BENDIX - WESTINGHOUSE in Elyria, Ohio, recently installed two *LANDIS* #1 Centerless Thread Grinders for threading slack adjuster gear worms used in automotive air brakes. This new threading method resulted immediately in fewer threading operations, fewer rejects, savings in critical materials, and longer product life.

Gear worm blanks are made of alloy steel, heat-treated to a 285-311 Brinell hardness. Former methods had required 7 separate passes to complete the threads. Threads were rough-cut before heat-treating in one pass, then finish-ground in six passes after heat-treating.

Using the *LANDIS* Centerless Thread Grinders, threads are now completed after heat-treating in *two* operations. Both machines are arranged for "upgrinding", a method developed by *LANDIS*, which allows up to 30% greater work surface speeds while maintaining concentricity and finish. Upgrinding allows deeper cuts, and threads are finished in two passes. For example, on the machine producing 3½ pitch threads on 1¼" gear worms, roughing takes a .108" cut, finishing .089", with 8 pounds of metal removed every hour.

Other important advantages have resulted from the new process. By grinding threads after heat-treating, locked-in stresses are eliminated, and BENDIX-WESTINGHOUSE reports show that product life has been doubled. In addition, a reduction in the number of rejects and the elimination of a nubbing on the workpiece (formerly required to facilitate threading) has effected substantial savings of critical materials.

This successful production story can be retold in your plant. Centerless Thread Grinders, built exclusively in the United States by *LANDIS*, are designed for highspeed mass production of screw threads ranging from 1/16" to 4¾" in diameter. Please send specifications when writing for additional information.

THE LANDIS *Machine* CO. 50TH ANNIVERSARY WAYNESBORO PENNSYLVANIA

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The Iron Age
FOUNDED 1855
News Section

HEAT PUMPS: The New Appliance Boom?

Century-old principle gets new attention as GE, Westinghouse market packaged air units . . . Competitors favor water heat source . . . Costs get competitive—By G. G. Carr.

You can't keep a good idea down forever. But sometimes it takes a little while.

Lord Kelvin outlined the theory of the heat pump to the Glasgow Philosophical Society in 1852. Heating and air conditioning engineers have kicked it around bull sessions ever since, but little was done on a commercial scale for a full century. Now it may be the hottest development in the appliance market since Mr. Edison's talking machine.

On the Market

Cause for excitement now is the presence of two appliance giants in the heat pump field. General Electric quietly started selling heat pumps for home use early last year. Westinghouse is going into production on its heat pump this month, plans to produce 3000 this year.

Custom and experimental installations have been in place around the country for several years. And at least two companies, Typhoon Air Conditioning of Brooklyn and Muncie Gear Works, Muncie, Ind., have been offering packaged home-size units for some time. Acme Industries Inc. of Jackson, Mich., has sold 350 units in 2 years.

How It Works

If thermodynamics is your hobby you can have a lot of fun figuring out how a heat pump works. A simpler way of understanding it is to walk into the kitchen, put your hand on your refrigerator's condenser coil. The heat you feel has been extracted from inside and is being dissipated in the open air. Your air conditioner works the same way.

Point of the whole thing is that heat is present everywhere down to absolute zero, −459.69 F. Naturally, the lower the temperature the less heat, but there's always some. Trick is to extract that residual heat.

The heat pump does precisely that. It extracts whatever heat is present in either well water, the earth or the outside air, depending on the unit. If your house is cold, the heat pump will send the warm air inside. If it's too hot for you, the heat pump will discard the extracted heat, pump in cooled air. Filtering and dehumidifying are done in the usual way.

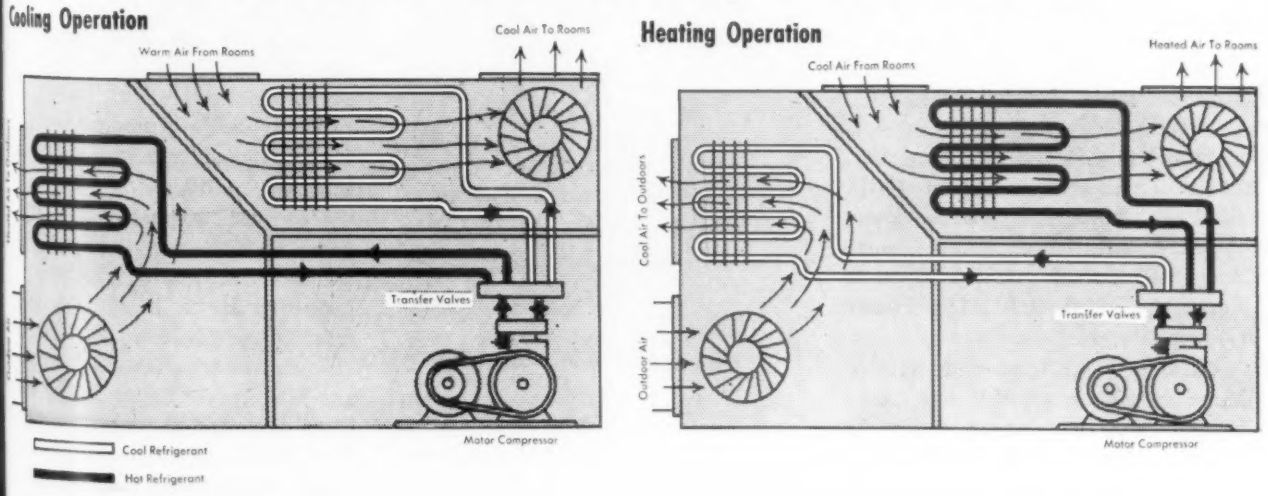
GE and Westinghouse both have had experimental models spotted around the country for some time, generally in the Deep and Border South. General feeling in the trade was that milder climate, cheaper juice and heavy demand for summer comfort made this area the strongest market. Typhoon, a Brooklyn firm, sells its units through Typhoon Prop - R - Temp Corp. of Tampa, Fla.

Earth, Air or Water?

Compelling factor in heat pump geography was the fear that colder climates would mean impractically large units and/or prohibitive current bills. These fears apparently turned out to be groundless.

GE has had an installation in New Jersey for years, and both that firm and Westinghouse plan to market their units nationally. Typhoon has had at least one contented customer in Seattle for

How GE's Air to Air Heat Pump Cools and Heats



some time. Acme Industries reports very satisfactory results from an installation in Jackson, Mich.

Basic to any discussion of heat pumps is the energy source. The units can be built to extract heat from either well water, the earth or the outside air. Each source has its proponents, and conflicting theories will probably furnish sales ammunition for some time to come. GE and Westinghouse are pushing air units as the most practical. Most other firms now in the field favor well water as a heat source.

What It Costs

Big question for any appliance is cost. Figures for heat pumps are hard to come by, principally because so few are in use yet. And operating costs vary drastically from one area to another. Differences in power rates are a big factor, as are regional differences in oil, gas and coal, all competitors.

Acme Industries says its prices run $2000 to $6000 for pumps ranging from 2 to 10 horsepower. But Acme has a unique type of unit which features low installation costs. Other companies admit installation costs can be an item in their own right.

As in air conditioning, charges for installation vary from dealer to dealer. Wary, many heat pump producers shy away from quoting firm prices for publication.

Operating Costs Competitive

Most detailed available material on costs is a Bureau of Mines publication, *Tests of A Heat Pump for Domestic Heating & Cooling.* The bureau in 1947 arranged to have a Muncie Gear Works "Marvair" heat pump installed on an experimental basis in the McLean, Va., home of the study's author, E. P. Carman. Cooperating in the experiment, in addition to Muncie, were American Gas & Electric Service Corp. and Virginia Electric Power Co.

Costs were an important part of Mr. Carman's study. He concluded that a 3-hp heat pump, complete with ducts but without well, can be installed in the Washington, D. C., area for around $3000 to $3200.

PRODUCTION WILL START on these air to air heat pumps at Westinghouse's Sturtevant Div. this month.

Costs of electricity for operating the heat pump were found, after adjustment to a base comparable with other fuels, to be, as of February 1953, less than anthracite and only slightly higher than oil or natural gas.

Sell 200,000 Yearly

Westinghouse has had three experimental units in operation for a year at Lynchburg, Va., Miami and Fort Worth. Average monthly operating cost at Lynchburg was $33.10, at Miami, $10.50, and at Fort Worth, under $40.00.

Nobody doubts that mass production and further research will bring costs down. Clarence H. Linder, GE vice-president—engineering, recently told the American Society of Refrigeration Engineers that his company expects that 200,000 heat pumps will be sold annually by 1960 at an installed price of less than $2000.

Reaction Mixed

Unknown quantity in heat pump costs is their effect on home building. Builders say year-round air conditioning will soon be a must to sell a new home. Heat pumps eliminate the need for chimneys and fuel storage space, allow placing of windows for design and illumination only. These savings could have an important effect on overall cost figures. GE has already installed a heat pump in a house designed to sell for $18,000.

An IRON AGE sampling of leading air conditioning firms found reaction to the heat pump well mixed. Some firms are frankly letting the other fellow be the pioneer. Others, like Servel, believe that a combination of a conventional furnace and air conditioner is more practical.

Philco Stays Out

A third group, including Frigidaire, Fedders-Quigan and Carrier, are actively studying the market. Nobody in the appliance business underrates the engineering and marketing brains at GE and Westinghouse.

Philco this year introduced a room air conditioner with a reverse cycle that can both heat and cool a room. The company has no plans to enter the central heating and cooling field, will stick with room-sized units for the present.

Several companies, like The Trane Co., told THE IRON AGE that they will continue to use heat pumps when they feel they are justified in custom installations.

Weather: Stormy, Comfortable

But nobody has forgotten ('though some wish it hadn't happened) that RCA's David Sarnoff has practically promised the American public an all-electronic air conditioner. RCA is keeping mum about this at present, but so revolutionary a development would obviously upset the whole heating and air conditioning applecart.

You can expect some stormy weather in heating and cooling in the next few years. Two groups of people will be happy no matter who wins: Utilities who plan on selling more and more current as the all-electric house comes closer to reality, and the average citizen who plans on being a lot more comfortable from here on.

TUBING: New Mill Produces Fast

Yoder introduces high speed nonferrous tubing mill . . . Thin wall welded tubing will emerge at 40 to 120 fpm . . . Market development needed; potential is big—By *R. M. Lorz.*

Within the next 30 days welded nonferrous tubing should be rolling off a continous production line for the first time when operations get under way at Bridgeport Brass sometime next month. Light walled tubing will be turned out on an integrated mill operating at 40 to 120 fpm.

High speed cold forming and induction welding of this tubing was made possible recently when the Yoder Company of Cleveland introduced a new tube welding mill which is already creating keen interest among producers and consumers.

Expect Big Production

Until Yoder developed its new equipment there was practically no light walled nonferrous tubing made. Because of its abrupt melting point and tendency to buckle the material just couldn't be turned and worked at high speeds.

Since the first welding mill is still being installed production estimates are necessarily sketchy. Those who had a hand in designing the mill estimate average hourly production at 4000 ft. Present plans call for completion of at least 5 mills by February of 1954. When that timetable is met it is conceivable that production of light walled nonferrous tubing could jump from practically zero to almost 127 million ft annually.

Needs Selling

While exact cost of producing each foot of tubing can't possibly be estimated at this time because there are so many variables involved, there is reason to believe it will not be too high. The real news stemming from introduction of the new mill is this: It will make forming and welding of thin walled material physically possible and economically feasible.

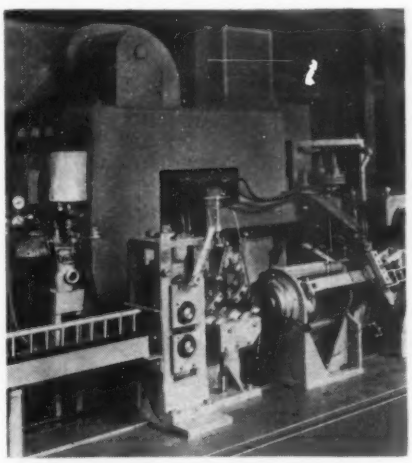
Talk of millions of feet of nonferrous tubing naturally poses the question of markets. The answer will have to wait until a really extensive program of market development has pointed the way. At the present time the program is still waiting to be officially born.

After the Bridgeport and other mills swing into action, production will initially be concentrated on aluminum tubing for irrigation. Some experimental defense work is also contemplated by the Navy.

In addition to the Bridgeport unit, Kaiser Aluminum, Aluminum Co. of America, and the U. S. Navy are on the waiting list.

Although at least 3 mills will be turning out aluminum tubing for irrigation, the potential for use in other fields is enormous. The general utility of the product and decreased production costs should greatly broaden sales horizons. It seems logical to expect that metal furniture, household appliances, plumbing fixtures, aluminum cable sheathing and many other products can be added to structural and liquid conveying tubing most popular now.

Possibilities for extensive use are also enhanced by a long list of weldable materials which includes a wide range of aluminum alloys available in coiled strip, certain magnesium alloys, brass and copper alloys, nickel and nickel alloys, austenitic and ferritic stainless steels and lighter gauges of carbon steel.



INDUCTION WELDING machine with 50-kw oscillator in rear. Tube seam is welded on Yoder machine after strip is cold-formed.

The mill, which will make exploration of these markets possible, wasn't designed overnight. Engineers had to grapple for months with new roll designs and rearrangements before moving nonferrous out of a costly hot processing and drawing cycle.

Success of their efforts can best be measured by comparing present minimum thickness possible in light walled tubing with past limits. Before the advent of the integrated mill practical minimum thickness for extruded aluminum alloys was about .050 in. or nearly double that of steel. Commercially steel tubing is now gauged down to .020 in. with a limit of 2 pct.

Tubing Is Strong

Nonferrous metals processed in the new integrated mill show a thickness diameter ratio of only 1 pct, wall thickness of .025 in.

Potential users worried about the strength of the continuous weld can put their minds at ease, designers say. They point out that physical tests on samples of type 304 stainless steel show tensile strength of the metal in the weld zone is about 15 pct higher than that of the strip from which it was formed.

Those close to development of the tube mill expect it to follow a pattern already established by other mechanical tube mills. They emphasize that transition from structural shapes to welded tubing was a slow process. At one point in the changeover the "experts" said the sales saturation point for resistance welding mills had been reached. That was over 5 years ago and mills for steel tubing are still very much in demand.

They believe the nonferrous mill promises to meet the same kind of acceptance.

INVENTIONS: See Them on Television

DuMont telecast of Big Idea program becomes showplace for inventions . . . Acceptance rate about 50 pct . . . Provides needed liaison between inventor, investor—By *T. Metaxas.*

Have you ever thought of a way to invent something that would meet a need in your personal or working life? If you are one of the many thousands of Americans who have a flair for gadgetry and mechanics you hastened down into your workshop and tried to invent that "better mousetrap."

Yet, how many brain-hours have been squandered by home inventors who lacked the promotional ability or the liaison with industry to put their invention into production? Enough creative thinking has probably been wasted to run all our research laboratories for years.

Thursday's Invention Night

Because inventor-industrialist liaison is at best anemic, much of our inventive work amounts to tinkering in a dead end leading to a U. S. Patent Office file. That agency estimates under 3 pct of patented inventions ever reach the factory.

To stop this waste, a television program called The Big Idea has stuck a finger into the dike. Each Thursday night New York City's DuMont station beams a half hour show demonstrating inventions in need of financing, promotion.

Of the four inventions displayed per program, two will be accepted by industry on the average. Giving the show a sugar coating of popular appeal, are skits which show humorously the need inspiring the invention.

Program host Donn Bennett, an ex-engineer, and his staff screen thousands of applications from crackpot Rube Goldberg devices to fundamentally sound ideas. Tribute to their acumen is that not one invention has failed to work during its video debut.

Inventors trying to crack The Big Idea show come in three categories. The first is the citizen who looks for personal situations where something new is needed or where present products do not fully meet the need.

Talented for Tinkering

The second group consists of the person who invents something to fill a need in his work—be it fitting shoes or drilling holes in metal. The third type, the professional inventor who makes a living out of gadgets, gets on The Big Idea for a wide audience.

On Donn Bennett's program have

GARAGE MECHANIC W. Adams shows off his invention to Big Idea host Donn Bennett. It's hydraulic auto piston.

come everything from blouse clips to auto parking devices. Were it not for The Big Idea many inventors could not market their brainchild. Talented in tinkering, many are ill-equipped for business.

Debuting on the program have been such devices as the Park-Eez, a truly clever set of hydraulically operated laterally rolling wheels installed in the rear of an auto. They can swing a car sideways into the narrowest parking space or roll it out onto the road.

Still in the automotive line, another inventor presented a hydraulic piston capable of withstanding 350,000 miles of wear before overhaul. Another introduced a "hydraulic pressure line safety valve" to prevent hydraulic brake failures. Interesting also was the Shur-Lock 5th Wheel device which combines coupling and braking control for airplane landing gear and trailer trucks.

For the metalworking industry, The Big Idea had the Drill-Saw which consists of a single shaft with a combined boring and reciprocating saw to drill and cut in a single operation.

To prevent dissipation of heat and combustible gases through chimneys, the Uni-Therm Chimney Cap uses insulation and a heat conserving filler to speed up smoke ejection, stop down draft.

Inventions catering to personal needs included such items as a skirt clip to keep blouses from riding up, an electrical device to stimulate and soothe aching muscles, a bell shaped hanger for skirts, a hopper to feed chickens during the day and slaughter rats during the night, a shoe fitter.

That industry is interested is proved by the speed with which negotiations for inventions begin —sometimes the following day.

Can You Make It?

Mr. Bennett told IRON AGE that The Big Idea was serving not only as a show place for inventions but also as the medium through which manufacturers could make known their needs. Too many of our home inventors are working blind, ignorant of what industry wants and doesn't want.

Several weeks ago, The Big Idea announced that a nationally known manufacturer of pneumatic tools wanted an attachment to fit an existing pneumatic tool. This attachment should weigh no more than 5 lb, hold a quantity of No. 8 to No. 16 penny nails which it would automatically hammer into shipping crates, etc.

Was the challenge accepted? More than 400 inventors, ranging in ages from 9 to 75, from tinkerers to engineers, sent in drawings.

STRUCTURALS: Bethlehem Boosts Output

Plans $30 million expansion of structural mills . . . Industry thinking shifting . . . See need for more capacity . . . Wide flange beams in shortest supply—*By J. B. Delaney.*

Steel producers may be changing their minds on structurals. For many years, they showed little interest in expanding structural steel capacity. They argued that the market potential and the ups and downs of construction activity did not justify spending the money. Emphasis was placed on expansion of flat-rolled facilities.

Industry thinking may be shifting the other way, and with reason. The market for structurals has been good. Building activity has been at high levels. Highway expansion has contributed to demand. Extensive bridge building is likely to continue.

Room For More

Producers of structurals expect demand to continue strong into 1954 and beyond. Structurals shipments through April of this year were at the annual rate of 4,931,532 net tons. This would be the third best year since 1940.

Bethlehem Steel Corp.'s plans to spend $30 million on expansion and modernization of structural mills at Bethlehem, Pa., prompted the reaction from other producers that this is something long overdue. Feeling is that still further expansion would be justified.

One mill executive feels that lack of structural capacity, particularly in the wide flange category, has tended to suppress use of structurals. He pointed to several projects where concrete was used because structurals were not available.

Boost Wide Flanges

Bethlehem's contemplated program, which is covered by Certificates of Necessity, visualizes additions and improvements to existing wide flange capacity at Bethlehem, plus installation of a new blooming and standard structural mill. Start of the program is indefinite, but it probably will get underway soon.

One of the reasons behind Bethlehem's decision is a desire to increase standard structural capacity so that wide flange facilities can be devoted entirely to production of the bigger shapes.

It is understood that the Bethlehem program will result in an increased capacity of 300,000 tons per year. Sources close to the problem of meeting demand feel this could be doubled without danger of over-expansion.

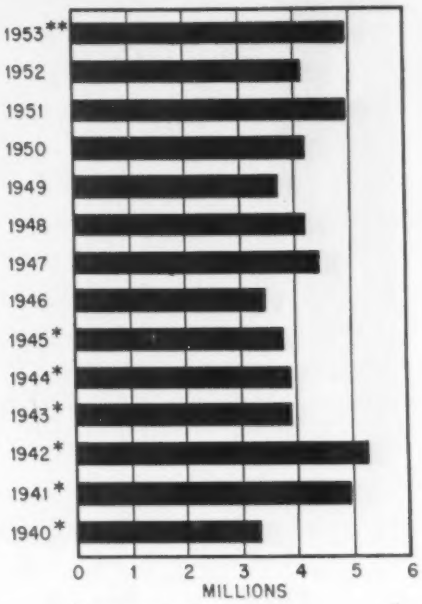
Who Makes Them

The situation has been particularly acute for wide flange sections. Bethlehem and U. S. Steel are the only producers of heavy shapes in the East. Bethlehem has three such mills, two at Bethlehem and one at Lackawanna, Pa. A 48-in. mill was installed at Bethlehem in 1908, and a 42-in. mill in 1920. The Lackawanna mill started producing in 1926.

U. S. Steel built its mill at Homestead in 1926 and the one at Gary shortly afterward.

ROLLING a wide flange beam at U. S. Steel's Homestead Works.

STRUCTURAL SHAPES SHIPMENTS 1940 -- 1953



* *Includes piling*

** *Estimated on basis of shipments 1,643,844 tons through April*

About 2 years ago Kaiser Steel Corp. converted a structural mill to production of wide flange beams at Fontana, Calif.

Inland Steel Co. was granted a Certificate of Necessity for construction of a wide flange structural mill in March 1952. But the company has no definite schedule for construction.

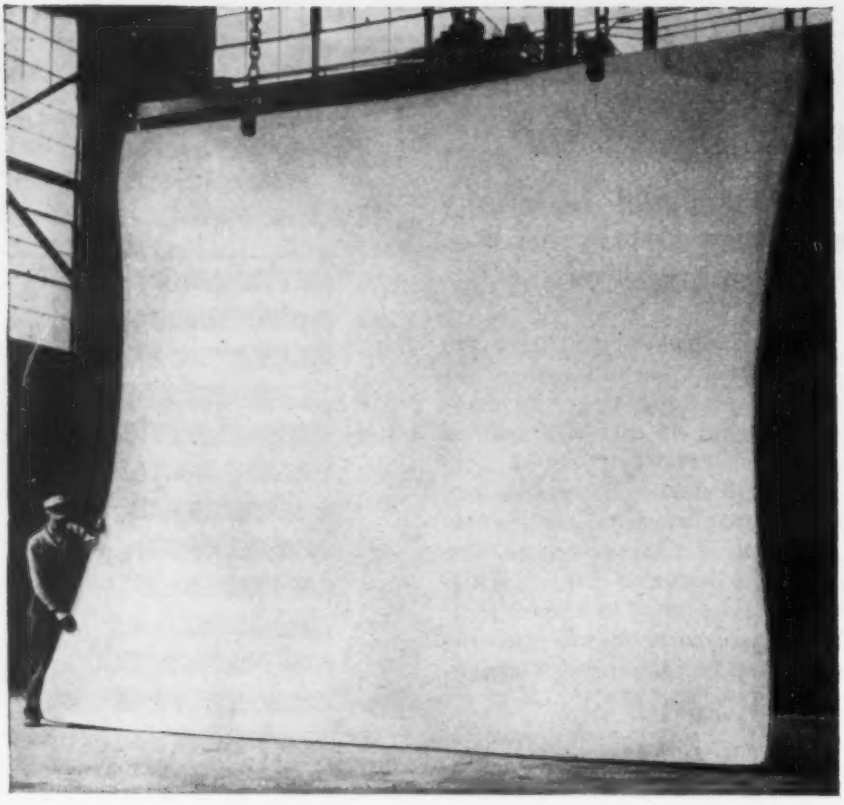
Where They Go

On standard structurals there has been no expansion since construction of the mills at U. S. Steel's Geneva Div. and at the Fontana plant of Kaiser Steel Corp.

American Iron & Steel Institute lists present structural capacity of the industry at 5,855,150 annually, about half of which is wide flange.

About 50 pct of structurals are used for construction purposes, including 22.5 pct for commercial buildings; 5 pct for highways; 5 pct for public works other than roads; about 2.5 pct for steel mill construction, and about 15 pct for miscellaneous projects.

Warehouses consume another 22.5 pct; transportation 10 pct, and shipbuilding 5 pct.



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Aid:

Congress limits foreign assistance to $5.15 billion.

Foreign aid spending during the current fiscal year won't be allowed to run higher than $5.15 billion.

That's the limit Congress put on military, economic and technical assistance funds last week in passing a compromise aid bill and sending it to the White House. The amount is $317 million less than President Eisenhower had requested, but over $159 million more than the House originally approved.

Europe Gets Most

In addition, the measure directs that foreign economic aid be ended by June 30, 1956, and military aid by June 30, 1957.

More than 40 pct of the total amount authorized, or about $2.12 billion, is intended for military assistance to Europe. Economic aid funds for that area are set at $250 million.

Earmarked in the bill are $1.08 billion for military help to Asia and the Pacific region, and $484 million for economic aid to Formosa and Indo-China.

Labelled EDC

Middle Eastern and African countries are in line to get $355 million in military aid, while $15 million for the same purpose is ticketed for Latin America.

Also authorized is a $200-million item for British and French production of equipment needed by the NATO countries.

Half of the military aid money authorized for Europe is labelled for use by the European Defense Community, which has not yet come into being. During this interim period, however, the funds could be committed through arms contracts with a lead time of more than 2 years.

No actual funds are made available by the bill approved last week. The measure placed a ceiling on the amounts which may be included in military and economic aid fund bills.

SKILLS: Not Enough to Meet Needs

Level of skilled personnel is falling in relation to increasing demand . . . U. S. not making best use of available manpower . . . Reds catching up—*By R. M. Stroupe.*

Measuring the depth of the nation's pool of trained manpower is a fairly easy task these days.

Probe anywhere, and you'll find the level of skilled personnel is falling, as contrasted with the ever-growing demands of a technically advancing economy.

Factories, foundries, construction projects, laboratories, and schools furnish evidence that the supply of capable job-holders is inadequate to meet current technical expansion.

Workers Can Do More

It's popular but misleading to blame the military for the scarcity of trained men. Only part of the shortage may justly be attributed to Armed Forces demands, as is shown in a new report from the Special Committee on Manpower Policy, National Planning Assn.

Not enough Americans, the committee asserts, are being employed to the full extent of their capacities. The report also questions whether enough is being done to utilize the training of millions of women and physically handicapped individuals.

What Wins Wars?

Concerning male labor, the committee foresees the need for important changes in our selective service and reserve recall rules. Industry, looking at the gaps created in trained employee ranks by the Korean war, is worried that a future emergency might cripple the available working force.

Military leaders say they must have potentially skillful men to keep our complex war machine in shape. Despite this necessity, the committee points out that "in modern war, economic potential is the long-run decisive factor."

Personnel shortages in some vital categories have become routine in both military and civilian life. For example, Gen. Nathan F. Twining, Air Force chief of staff, says the re-enlistment rate for airmen with certain high specialty ratings is down to 15 pct. This means we may be reaching a point where there won't be enough crews to operate our military instruments and machines.

"There are many indications," Gen. Twining said, "that the rapid improvement of air weapons by the USSR is gradually overtaking the technical superiority we have always counted on."

Emphasis is given to this view in the committee report which states:

"The number of Russian higher educational institutions of all sorts has risen in the last 20 years from about 150 to about 900; the student population from around 200,000 to around 900,000; the number of graduates from around 50,000 to around 200,000."

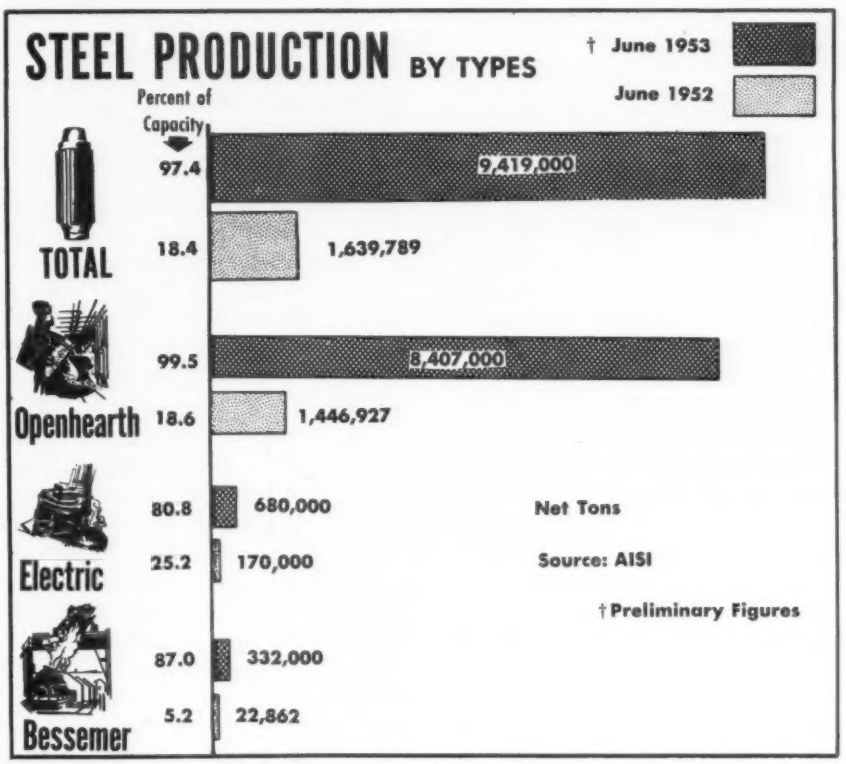
Behind these statistics is the obvious fact that the Reds want to cut down, as rapidly as possible, the edge which the U. S. holds in trained personnel and equipment.

Numerically, of course, Russia has a marked advantage, with a total population that exceeds this country's by around 40 million. Even when the "bumper baby crops" of the decade following 1940 begin to come of age, the U. S. will still lag in total population compared to the Soviet Union.

Revise Draft

To offset the Russian's numerical superiority, the committee says we will have to make more intensive use of our manpower. It advocates new thinking on both the draft and recall of military reservists, and states that provisions will have to be made to assure college education for more young people.

One question raised by the committee—that of fatherhood deferments for draft registrants who already have student or employment deferments—was dealt with in a recent White House order. President Eisenhower has barred deferments for new fathers who cannot prove that "extreme hardship and privation" would result from military service.



MANGANESE: Explore African Find

New lode may contain 50 million tons . . . But it will take years of exploration to check . . . U. S. Steel is 49 pct owner, French hold rest . . . Site is 250 miles from seacoast.

Vital raw materials seem to have a way of hiding in out-of-the-way points on the globe. Latest indication of this is the recently publicized manganese find in French Equatorial Africa, in which United States Steel Corp. has acquired a 49 pct interest. The French firm Comilog, has cleared mining rights with the government.

The deposit is not a new discovery, having been found by the French some 10 or 15 years ago. This orebody may someday be destined to contribute heavily to the furnaces of U. S. Steel.

French sources estimate it may contain as much as 50 million tons of ore, though U. S. Steel spokesmen feel it is much too early in the exploration to make any such estimates. The French also liken the quality to the high-grade ore Russia used to export to the U. S. But again exploration is too sketchy for such statements.

Seek New Sources

This nation is dependent on foreign sources for some 90 pct of its manganese requirements. Only a few years ago Russia was the top supplier for the American steel industry's needs. But this has completely faded since 1950. Present sources are Brazil, India, the African Gold Coast, Cuba, Chile, Union of South Africa, Mexico and other such widely scattered places.

Steelmakers have been extremely active during recent years in developing many promising deposits. This has been accelerated by the fadeout of Russian manganese. As a result, it's generally felt that the U. S. no longer needs Russian manganese—but the more new finds added to the reserve the better.

Job of thoroughly surveying the African orebody is still in its initial stages but all the legal and inter-government obstacles have been cleared away. U. S. Steel indicates that exploration will require at least 3 years.

There is a possibility that if the firm finds the ore too expensive to mine and ship it will continue to rely mainly on other sources of manganese.

Develop High Grade Ore

More than 2 million tons of iron ore per year may move to this country from Peru as a result of a loan granted by Export-Import bank.

The $2.5 million loan is to Marcona Mining Co., a subsidiary of Utah Construction Co. and Cyprus Mines Corp.

Marcona is developing a high grade ore deposit 20 miles inland from San Juan Bay and about 370 miles southeast of the capital city of Lima.

Loan will be used to further establishment of a completely integrated operation, including open pit mining, truck transportation to port, and port facilities.

Ore will be delivered to a U. S. steel producer who will blend it with domestic ores.

Site is near Franceville, some 250 miles inland from Port Noire. There are several rivers leading from the deposit to the coast, but it is not yet certain whether these can be made navigable for ore ships. If they can't, a railroad would have to be built instead.

Another jungle manganese deposit being developed by U. S. Steel is the one in Mato Grosso, Brazil. This find is considerably farther along in its development. An Export-Import Bank loan of $30 million was granted in 1950 for work on this site. The steel firm also holds a 49 pct interest in this ore bed with a Brazilian company owning the remainder. Eventual production of the Mato Grosso find is estimated at 300,000 to 500,000 tons of ore annually.

Considerable research is also being done to find commercial methods for extracting manganese from low-grade deposits in the U. S. as well as for removing the manganese content of open-hearth slag.

Contracts:

DMPA signs for 550,000 tons of Mexican manganese ore.

A goal of 550,000 tons of Mexican manganese has been reached with the signing of five new contracts by the Defense Materials Procurement Agency.

New contracts cover production of 133,500 tons to be supplied by Impulsora Minera and Minera Anahuac, both of Mexico City; Minas Consolidadas, of El Paso; Associated Metals & Minerals Corp., of New York, and Elmer Perry of Los Angeles.

Similar contracts with 12 other producers, covering 416,500 tons, had been signed previously for production from about 100 mines in the Chihuahua, Durango, Zacatecas, San Luis Potosi, and Jalisco areas.

Price to the government will be $19.30 per long ton of 25 pct ore with a premium of 70¢ a ton for each 1 pct of higher content. A penalty of $1 per ton will be imposed for each 1 pct less than 25 pct, with none under 20 pct.

PAD OK'd $6 Billion for Expansion

A good idea of the vast expansion of the oil and gas industry may be obtained from the July 1 report by the Petroleum Administration for Defense.

For the 2-year period ending June 30, PAD approved more than 6300 applications for oil and gas construction involving nearly $6 billion in costs.

This figure fails to cover all ex-

pansion, since many projects required no priorities or other action by the government.

Projects approved for natural gas expansion led the list in value, totaling roughly $2.4 billion. Assistance extended for refinery expansion totaled $1.6 billion, while supply and transportation facilities received $1.2 billion.

Coal Mining:

Attempt to boost Alaskan coal output may mean more jobs.

Alaska may turn out to be the land of opportunity for coal miners who are finding employment is fading as coal demand slips.

Survey Coal Reserves

Interior Secretary McKay has ordered an extensive survey of Alaskan solid fuel resources with the intention of seeing what can be done to help Alaska supply more of its own coal supplies from local fields.

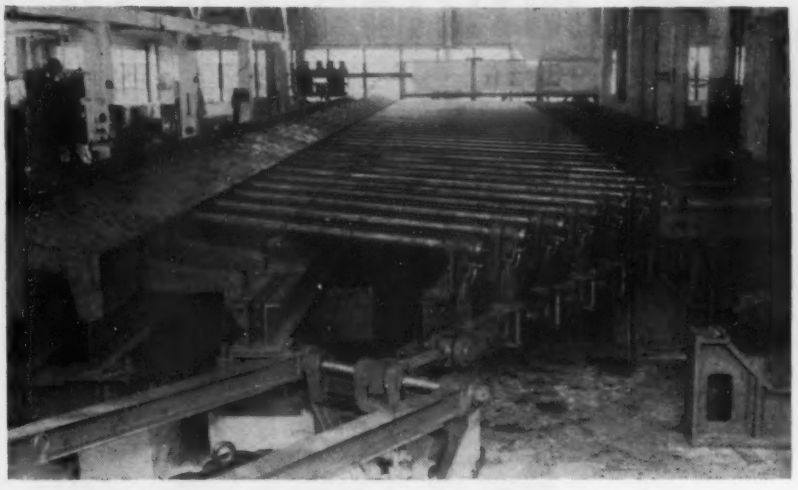
A tentative production goal of 950,000 tons has already been set by the Office of Defense Mobilization. This would mean a boost in production of 265,000 tons above the 1952 output which amounted to only 685,000 tons.

Will Check Needs

Survey will take from 60 to 90 days. In addition to investigating the coal reserves and potential production capacity, the survey will also gather data on both civilian and military requirements, transportation facilities, and availability of mining manpower to expand Alaskan coal mining operations.

Continue Search for Canadian Ore

Further exploration and development of holdings in hope of finding commercially profitable Canadian iron ore will be conducted by the Fenimore Iron Mines, Ltd., from proceeds of sale of an additional 1 million shares of common stock. Application has been made to the Securities & Exchange Commission for U. S. registration on a speculative basis.



PHILIPPINES: Mill to Roll Next Year

Shipboard fire delays delivery of rolling mill components . . . Will use "skew roll" cooling bed — first of type to be built in U. S. . . . Scrap supply abundant.

A new steel mill on the island of Mindanoa in the Philippines will soon get a skew roll cooling bed just completed by Jackson Industries, Birmingham. The bed will team up with a rolling mill and flying shear at Iligan City where the new and small steel company will operate a merchant bar and rod mill.

With one electric ore furnace National Shipyards & Steel Corp., a government agency, expects to make about 20,000 tons of finished products per year. By adding another furnace, capacity can be doubled.

National Shipyards expected to get the rolling mill into production this fall—but a shipboard fire destroyed much of the mill's equipment. Probable starting date is now set at sometime in the spring of next year.

Designed with the rest of the mill by Hydropress, Inc., New York City, the skew roll cooling bed is the first of its type to be completely built in the U. S. It will take hot steel rods and shape and move them across the bed (160 ft long and 16 ft wide) to cool them. Main feature is the 30° skew angle of the 5-in. diam steel rollers.

The skew gives the rods simultaneous lateral and longitudinal motion resulting in a continually changing contact point between roller and the rod as it cools. Claimed are more uniform cooling, elimination of chill spots, a straighter product. The rolling mill will make rods ⅜ to 1 in. diam and angles up to 1½ x 1½ in.

Rich iron ore mines in the Philippines and a heavy accumulation of World War II scrap coupled to steel shortages after the war gave impetus to the idea of an island steel industry. And the war ravaged islands needed steel for rehabilitation.

Drawbacks to the establishment of a large steelmaking plant is the absence of good coking coal in the Philippines and inadequate electric power. Private capital remained timid in the face of these deficiencies. Probability of foreign steel becoming abundant in a few years at cheap prices was another deterrent.

However, several small companies have been organized to process by rerolling from scrap such products as reinforcing bars, flats, and small angles. Because the islands have no steelmaking industry to speak of, steel scrap piles up and is comparatively plentiful.

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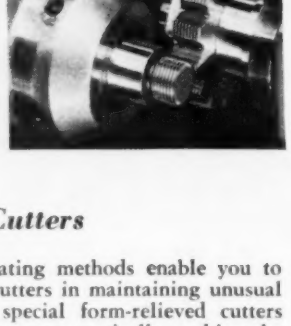

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ATOMS: Plan Nuclea

AEC will cooperate with state utility commission committee study of private atom use.

Atomic Energy Commission says it welcomes a proposed survey of the nuclear power development program, to be made by a six-man special committee representing the National Assn. of Railroad & Utilities Commissioners.

A Big Job

Known as the Committee on Development & Use of Atomic Power in the Electric Industry, the group must get full security clearance before AEC will grant access to classified power reactor data. Members expect to give particular attention to economic and legislative problems and to have a report ready during September.

Meanwhile Congress is finding that the job of taking the pulse of the nation's potent atomic energy program is a much bigger task than was anticipated.

Plan Atom Future

Recognizing that the 10-year-old infant "industry" has now grown up, Rep. W. Sterling Cole, R., N. Y., and members of his Senate-House Committee on Atomic Energy have begun to take a close look at the booming new military-civilian science and shortly will try to set some basic policy decisions to guide future development.

Basic question confronting Washington with regard to future use of the atom is this: Should the Federal Government relinquish its monopoly in the field of energy production? If so, should it withdraw completely from all but military types of energy production? Should private power companies be regulated in their atomic programs? To what extent?

How They Feel

The decision is not an easy one. The clear advantages of private development by industry must be balanced against the demands of military security. Here are some of the key points that have turned

Power Survey

up in testimony from committee witnesses:

A civilian atomic energy industry would increase national capacity for producing fissionable materials to about 10 times its present size. Government subsidies to a civilian atomic industry would not be best for growth of the industry.—*John R. Menke, president, Nuclear Development Assn., Inc.*

Provide More Revenue

Government should join with industry in commercial development of the atom because a plant could not be built without use of government-held patents. — *Walter H. Zinn, director, Argonne National Laboratory.*

Government should assume responsibility for development of inexpensive nuclear power in demonstration plants which could serve as working models for industry.—*Alvin M. Weinberg, Oak Ridge Laboratory.*

Industrial development of atomic energy may provide some additional revenue for the U. S. Treasury through user charges levied upon private firms producing energy. These fees would be similar to leases on government oil lands.—*Under Secretary of Commerce Walter Williams.*

Must Compete

Many industry officials are agreed that civilian atomic power development is practical today—if subsidized by the government.

Two firms engaged in atomic research—Dow Chemical and Detroit Edison—indicate they are willing to proceed with an experimental atomic power plant in the near future. But there appears to be no immediate prospect of industry-wide eagerness to jump into the nuclear power business at the civilian level until research turns up new ways of bringing down costs.

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CAN'T YOU JUST PICTURE THIS MAN trying to pull this load with an old-fashioned manual hand truck! It's a cinch he wouldn't have a smile on his face—there'd be sweat and strain, because those transmission housings weigh pretty near three tons!

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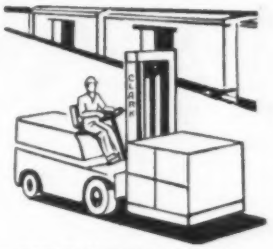
Get the facts from your nearby CLARK Dealer (look under "Trucks Industrial", in the Yellow Pages of your phone book) or use the coupon below.



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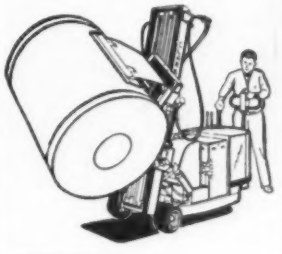

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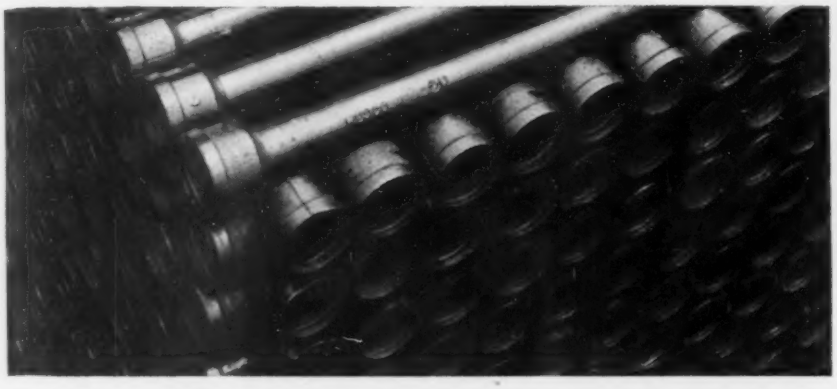
SOIL PIPE: Cast Iron Fights Back



War shortages permitted inroads by new materials . . . But the stimulus is good . . . Founders sponsor research standardization, public education programs—By *R. L. Hatschek.*

Cast iron soil pipe's market was invaded during World War II by several types of non-metallic pipe. The beachhead was reached by these substitute materials because of the pig iron and scrap shortages during the war. It's been held because many of the substitutes are cheaper than cast iron.

But now the industry has been harried into doing something to recoup its losses. The relatively young (founded in 1949) Cast Iron Soil Pipe Institute is sponsoring research, standardization and broad public education to promote its product and the plumbing business in general.

In the industry-wide sales program the Institute plans to stress such points as cast iron pipe's strength, corrosion resistance, joining methods, suitability for pre-assembly, and acceptance by all plumbing codes for drainage inside and outside of buildings.

Since leaking sewage is a natural fertilizer and attracts tree roots, it poses a key problem for pipe joints. Roots can penetrate tiny crevices and crack the pipe when they grow. For this reason the institute is sponsoring a "tree root garden" at the University of Alabama for the study of root resistance by cast iron and several competing types of soil pipe.

Parallel rows of different type pipes have been laid according to manufacturers' specifications by qualified plumbing contractors. Between the runs typical vigorous root producing shrubs and trees are growing. Pipes carry circulating water with a soluble fertilizer to duplicate the effect of sewage on root growth.

The "garden" is a long-term project and since it is only a year and a half old, it is still too early for evaluation of data. Pipe joints are to be inspected each Fall and reports made at the end of 1, 2, 3, and 5 years.

The industry is not only striving to prove that its product is good but to improve it. Along this line is the institute's new commercial specification for service weight cast iron pipe and fittings.

Prepared in cooperation with the National Assn. of Plumbing Contractors, it was designed to eliminate sub-standard material and permit greater interchangeability. The standard covers dimensions, weights and tolerances as well as requirements for marking, coating, threading, inspecting and testing.

Will Aid Builders

This double standard, service weight and extra heavy, will simplify plumbing code provisions for this type of pipe, say Institute officials. The U. S. Dept. of Commerce circulated copies for acceptance by plumbing inspectors, manufacturers, architects, sanitary engineers and wholesalers.

In this way the specification was established as the commercial one by voluntary endorsement. It has now been published by the Dept. of Commerce.

Big angle in the public education program is the durability of cast iron soil pipe and the long-term economy resulting. The industry points to installations that are many centuries old and still in operation. Among them are the fountains at Langanzalla, Germany, installed in 1502; water mains in Versailles, France, put in 288 years ago.

Cases are cited where other materials have failed in only a few years. Initial savings are compared with the costs of repairing these failures.

POURING IRON from a four-lipped ladle into pipe mold.

STEEL: Austrians High on Oxygen

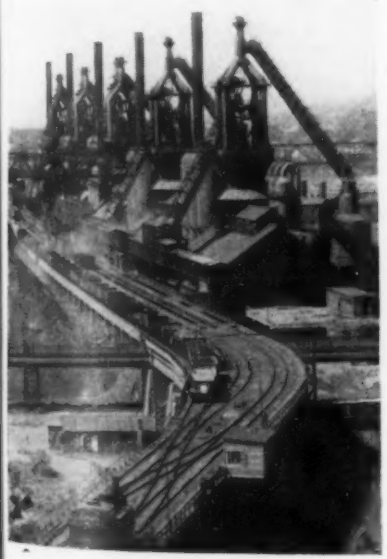
Report oxygen steelmaking process shows promise . . . Modified Bessemer method may be solution to Austria's steel expansion problems . . . How oxygen steel is made.

Among the first users of the oxygen steelmaking process which will soon be tested in Canada (THE IRON AGE, July 2, 1953, p. 75) was Austria's Linz iron and steel works which has had two 30-ton oxygen blowing converters in operation since early this year.

Optimistic reports from company officials indicate the method, a modified Bessemer process in which oxygen is blasted at supersonic speeds through the top of a solid-bottomed converter, is lowering overall costs and is producing better steel.

The Austrians also find the oxygen process is well suited to the peculiarities of their industry. And reports that the capital investment needed to set up an oxygen steel plant is about one-half that required for an openhearth works of equal capacity, are creating interest in underdeveloped countries planning to establish their own steel industries.

Like most other European countries Austria has had to utilize iron ore of rather poor quality. Pig iron produced from this ore is not suitable for openhearth use without further refining. Product of local Stryian ore has presented difficulties even in Bessemer practice. And Bessemer steels have been notoriously subject to strain age hardening, becoming too brittle for drawing required in many manufacturing processes.



USE of oxygen steelmaking method at Linz iron and steelworks in Austria makes it easier for the firm to use the low-phos pig made in its five blast furnaces.

Use of the oxygen blowing method, however, makes it possible to handle this low-phos pig iron efficiently in modified converters. Another reason the Austrians have high hopes for this process is that the country's abundant supply of hydroelectric power cuts the cost of production of tonnage oxygen.

Good for Cold-Working

Advantages claimed for steel produced by the oxygen method are: Less segregation than in openhearth steel of similar composition, better corrossion resistance and less brittleness.

Oxygen steel is said to have good cold-working characteristics. Bearing out this point, the Linz plant is placing increased emphasis on production of flat products and plans to install a four-high cold-rolling mill.

Operating costs are said to be somewhat lower, since the expense involved in replacing converter bottoms is cut.

Use Solid Converters

In the oxygen blowing converters being used at the Linz plant (a similar installation was completed at Donawitz in May) oxygen, under a pressure of 59 to 176 psi, is blasted through a water-cooled tube onto the surface of the molten metal. Distance of the tube's nozzle from the surface of the bath is 32 in.

Oxygen is supplied from a generating plant 1500 ft away, and consumption is rated at 2000 cu ft for each ton of steel.

Completely solid, the oxygen converters have no tuyeres (air holes in the bottom of the converter) and are lined with a 16-in. layer of dolomite magnesia. Lining life is reported to be 120 heats, with dolomite consumption averaging 125 lb per ton of steel.

ONE OF THE FIRST to use oxygen steelmaking process, the Linz works reports the method is enabling it to make better quality steel economically.

Flame Drops

After being charged with molten pig iron and scrap, the oxygen converter is elevated to a vertical position. The blast nozzle is then adjusted with the oxygen on, and lime is added through a chute.

Blowing time for the process is 17 minutes, 40 seconds for a 30-ton charge. End of conversion is marked by a drop in the flame, since combustion of the phosphorous and carbon is simultaneous.

Engineers at the Linz plant report production of a 30-ton oxygen converter during a 24-hour period is about 300 tons more than output from a 200-ton openhearth.

License Carbon Black Process

Degusa, Germany's leading producer of carbon black, will shortly construct a new plant which will utilize American patents and technical knowledge.

Germany alone now requires more than 50 million lb annually. Other continental requirements are estimated at more than 150 million lb, of which about 85 pct must be imported.

STRETCHOUT: Tanks, Trucks Cut First

Defense Dept. scales down tank, truck buying rate to $50 million per month . . . Nine plants may be out of production by May . . . No ammo cut coming—By *A. K. Rannells.*

Defense Dept. last week pushed ahead on its phase-out program, reducing the volume of its procurement contracts and the number of producers working on them.

First area affected was the tank and truck field. However, Army Secretary Stevens says the whole procurement program is now undergoing review.

Mobile equipment contracts were pared first, largely because the military reserve goal is now in sight.

The drop in orders was not unexpected, however. Last December, the Army said it would stretch out production of 2½-ton trucks and now the heavier 5-tonners have been included in the phase-out program.

Slow Production

Since the start of the Korean shooting, it is estimated that the Army received 280,000 trucks and up to 13,000 tanks. Korea has chewed up only about 800 tanks and 40,000 trucks.

Effect of the stretchout over the immediate future will be to scale down the tank and truck buying rate to about $50 million a month from the current $160 million per month pace.

This means that 9 of the 14 plants now producing tanks, military trucks, and engines will be pulled out of production by next May unless lines can be diverted to civilian output.

Who Stays in Production

Outlook for Detroit in view of the Army's current planning is:

¶ Cadillac Div. of General Motors, only builder of M-41 light tanks, will continue production at its Cleveland plant.

¶ Continental Motors will keep up production of light and medium tank engines at Muskegon, Mich.; Chrysler will complete its contract and close down its Michaud, La., plant.

¶ As previously planned, Ford will complete its M-48 tank production schedule by end of the year; Chrysler and Fisher will bid against each other for a new contract.

¶ Chrysler will stop building heavy T-43 tanks after production for the current contract at its Newark, Del., plant is completed.

¶ Studebaker will stop production of 2½-ton trucks after this year; Reo and GM's Truck and Coach Div. at Pontiac, Mich., will compete to continue output next year.

¶ Contract for 5-ton trucks after December will go to the lowest of three bidders—International Harvester, Mack-International, and Diamond T. All are now producing under Army contract.

Won't Cut Ammo Output

As the Pentagon moves from tanks and trucks into other fields, indications are that the same yardstick will be used in determining the order and amount of new "consolidation."

At the moment, there is no plan for a quick scaling-down of ammunition and related production schedules, even in the event of a truce, the Pentagon says.

Two problems causing the most speculation at present concern labor and the mobilization base. The Pentagon has not issued a statement about what will happen to workers laid off because of the stretch-out program, but industry sources in Washington say that the majority of the displaced tank, engine, and parts workers can be shifted to civilian production.

Keep Tabs on Manpower

Accurate data on 100,000 U. S. scientists and engineers, being gathered as a basic tool in meeting manpower demands in a variety of specialized fields, will be available by June, 1954.

Decentralized registers containing this information will be treated as standby machinery which, in a national crisis, will help to identify and locate scientific personnel with special skills. By mid-1955, it is expected that the original registers will be expanded by the addition of data on all major scientific fields.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Racks, storage pallet, 3702, $274,564, A. F. Anderson Iron Works, Chicago.

Hammers, hand and faces, 57920, $131,044, New Plastic Corp., N. W. Washington.

Diesel generator sets, 9, $231,601, Fairbanks, Morse & Co., Chicago.

Conveyors, gravity, roller, 1872, $70,755, Harry J. Ferguson, Jenkintown, Pa.

Trailers, warehouse, 150, $121,074, Standard Mfg. Co., Mount Airy, N. C.

Handles, socket wrench torque, 2742, $209,763, Plomb Tool Co., Los Angeles.

Drill twists, 44915 ea, $51,401, Union Twist Drill Co., Athol, Mass.

Gages, 2 ea, $93,265, Industrial Precision Products Co., Chicago.

Primer, percussion, 10500 units, $81,480, Grinnell Screw Products Co., St. Clair Shores, Mich.

Auto spare parts, 7500, $166,350, Holley Carburetor Corp., Detroit, *N. Dann.*

Auto spare parts, 5000, $79,150, Ainsworth Mfg. Co., Detroit.

Tank spare parts, 57090, $436,406, Continental Motors Co., Muskegon, Mich.

Plug closing for shell 90 MM, 90000 pieces, $44,865, Belleville Screw Products, Inc., Detroit.

Trucks, gas, 128, $1,182,189, Mandt Mfg. Co., Chicago.

Conveyors, portable electric, 236, $234,316, The Oliver Corp., York, Pa.

Truck, fork, gas, 23, $99,910, Clark Equipment Co., Buchanan, Mich.

Handles, socket, wrench, 485, $200,395, James R. Kearney Corp., St. Louis.

Trucks, fork lift, gas, 22, $136,303, Clark Equipment Co., Buchanan, Mich.

Chargers, battery, 575, $387,282, The Hertner Electric Co., Cleveland.

Modular containers assy, 182 ea, $117,882, The Multiple Breaker Co., Boston.

Practice projectile, 20 MM, 3270 units, $55,099, Albert Wright, Emeryville, Calif.

Netting, camouflage, wire, steel, galvanized, 669950 lin. yd, $80,394, Decotone Products Co., Collingdale, Pa.

Netting, camouflage, wire, steel, galvanized, 13621 roll, $108,832, The Gilbert & Bennett Mfg. Co., Georgetown, Conn.

Netting, camouflage, wire, steel, galvanized, 22240 roll, $226,636, Northwestern Steel & Wire Co., Sterling, Ill.

Netting, camouflage, wire, steel, galvanized, 13620 roll, $113,318, Indiana Steel & Wire Co., Muncie, Ind.

Trucks, two wheel handle, 6630, $140,010, Firestone Tire & Rubber Co., Los Angeles, *H. E. Ludwick.*

Trailer, general purpose, 2208, $1,520,184, Farmer Feeder Co., Cambridge City, Ind.

Maintenance parts for bomb hoists, 18822, $224,334, The Aro Equipment Co., Bryan, Ohio.

Drill twists, 166940 ea, $75,670, Atlas Hardware Co., New York.

Marker, minefield, 1044778 ea, $95,715, Temple Steel Products Co., Lufkin, Texas.

Spare parts, 526 ea, $1,181,033, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

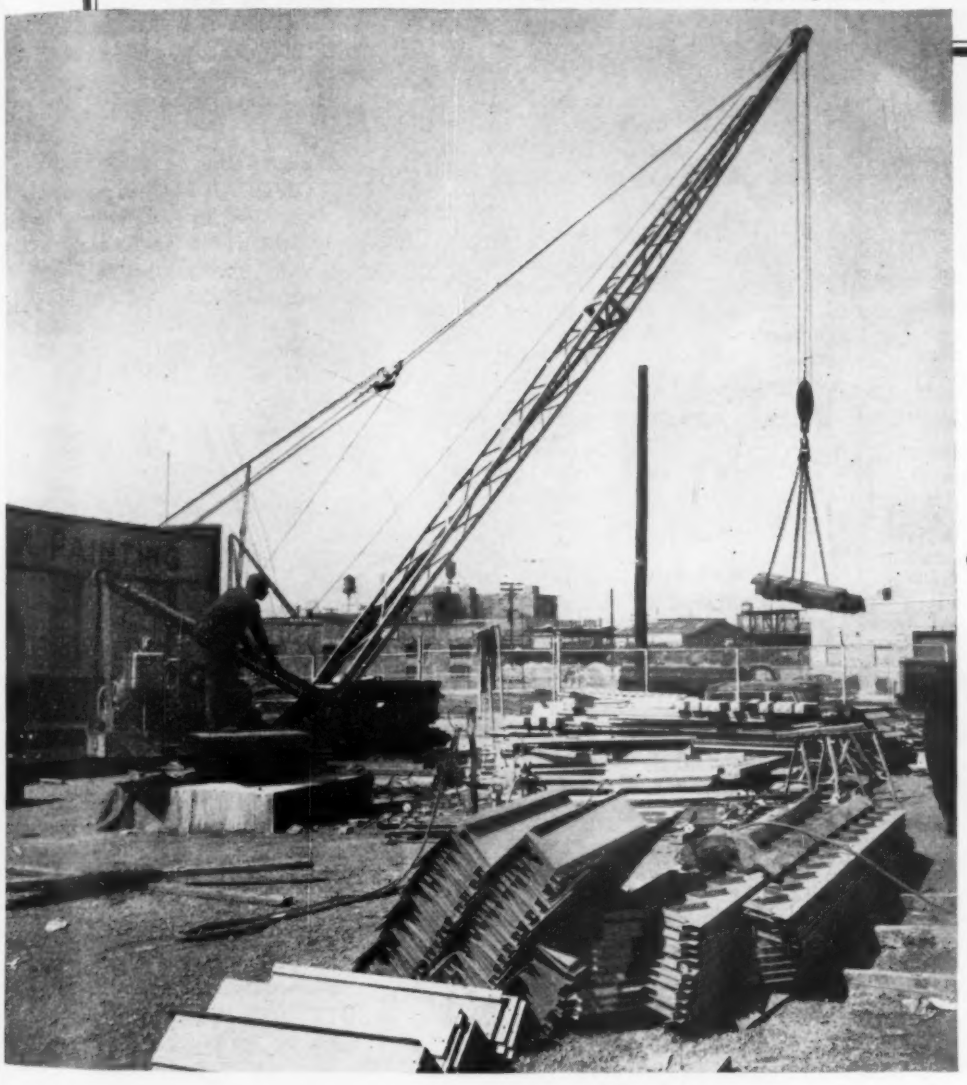
Handle loads safely and economically with a Clyde W-3 WHIRLETTE

SPECIFICATIONS
Hook Work Only — Not For Clam Shell

CAPACITY AT	10' Radius	15' Radius	20' Radius	25' Radius	35' Radius	40' Radius
	10,000 lbs. (Special Tackle)	6500 lbs.	4500 lbs.	3500 lbs.	2500 lbs.	2000 lbs.

HOIST LINE SPEEDS— 50 f.p.m. to 160 f.p.m. Hoist line pull 3000 pounds. BOOM LENGTHS, 20 feet, 30 feet, or 40 feet. LOAD TACKLE, 3 parts for capacities to 8,000 pounds. HANGER TACKLE, 7 part. Roller path, 36 inch diameter. TAIL SWING, 5 feet 6 inches with 2-drum hoist and swinger. Required counterweight, 1,250 pounds steel punchings.

The complete unit includes turntable, center pin and rollers, rotating platform with counterweight box, A-frame and back-legs, power unit with or without swinger, tackle blocks and operating cables.



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ONE FOUNDATION

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NO GUY WIRES OR STIFF LEGS

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OPERATOR ALWAYS FACES LOAD

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GASOLINE OR ELECTRIC POWER

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MANUAL OR POWER SWING

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PORTABLE OR STATIONARY MOUNTING

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SUBSIDIARY OF BARIUM STEEL CORP.

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CAR PULLERS · HANDI CRANES · ROLLERS

HAVE YOU SEEN THIS NEW BOOKLET?

IT TELLS HOW TO DO THE HARD JOBS

Better cleaning cuts costs in aircraft production. This 48-page illustrated booklet outlines all the big cleaning jobs. Have you seen the latest Oakite recommendations on:

¶ How to clean aluminum in preparation for anodizing? *See page 4.*

¶ How to prepare aluminum for spot welding? *See page 10.*

¶ How to prepare aluminum for painting? *See page 15.*

¶ How to clean aluminum before and after heat treating? *See page 20.*

¶ How to strip paint from aluminum? *See page 22.*

¶ How to clean magnesium? *See page 27.*

¶ How to select and install cleaning tanks, rinse tanks, and spray-washing machines? *See pages 31 to 35.*

¶ How to treat water in paint spray booths? *See page 36.*

¶ How to clean engine test cells? *See page 40.*

FREE For a copy of *"How to clean metals in aircraft production"* write Oakite Products, Inc., 30H Thames St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

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MATERIALS • METHODS • SERVICE

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Industrial Briefs

Doing Business Elsewhere . . . THE ELECTROCHEMICAL SOCIETY, INC., has moved to larger premises at 216 W. 102nd St., New York 25.

Great Expectations . . . AMERICAN MANAGEMENT ASSN. will sponsor meetings during the 1953-54 fiscal year which are expected to be attended by 50,000 business executives from all parts of the U. S. and a number of foreign countries.

Last Call . . . AMERICAN INSTITUTE OF STEEL CONSTRUCTION has set a deadline of Sept. 14 for entries in its annual Aesthetic Bridge Competition.

Forward Step . . . METAL HYDRIDES, INC., has signed an option to acquire 60 acres of land for plant expansion in Beverly, Mass.

Hear Ye . . . The eleventh annual PITTSBURGH DIFFRACTION CONFERENCE will be held at Mellon Institute, Pittsburgh, on Nov. 5 and 6, 1953.

Record Set . . . KAISER STEEL CORP. announced record production of 770,000 net tons of steel ingots for the 6 months ended June 30th, thus exceeding any previous 6-month record by 10.6 pct.

Job Well Done . . . Harold B. Ressler, chairman of the executive committee, JOSEPH T. RYERSON & SON, INC., retired from active service but remains a director.

Congratulations . . . Minnesota Ore Div., JONES & LAUGHLIN CORP., will be awarded certificates of achievement by the Bureau of Mines for operating without a lost-time injury during 1952.

Appointment . . . MAGNET ENGINEERING & MFG. CO. has announced that Mills Engineering Sales, Inc., Chicago, will be their exclusive representative in that territory.

Celebrating . . . THE CHALLENGE MACHINERY CO. marked its 50th anniversary of manufacturing in Grand Haven, Mich., on June 29.

Ready to Roll . . . THE TORRINGTON MFG. CO., Torrington, Conn., will start construction of a half-million dollar plant adjacent to its Air Impeller Div.

Something New . . . NORTON CO., Worcester, Mass., announced the establishment of a Job Lapping Dept. to improve metalworking performance through use of precisely lapped parts.

Currency Conversion . . . E. F. HOUGHTON & CO., Philadelphia, has obtained a government guaranty of currency conversion up to $93,000 in payments by a new West German firm for manufacture of metallurgical oils.

Giant Brain . . . INTERNATIONAL BUSINESS MACHINES CORP. has introduced a new machine called the IBM Magnetic Drum Calculator, designed to meet vast accounting and computing requirements.

Capacity Plus . . . ELECTRO METALLURGICAL CO. has new facilities in operation at its Alloy, W. Va., plant which will double capacity for producing medium-carbon ferromanganese.

Address Changed . . . FEEDALL MACHINE & ENGINEERING CO. has recently moved to their new plant at 38399 Pelton Road, Willoughby, Ohio.

Under Contract . . . HYDROPRESS, INC., New York, has been awarded a contract for a hydraulic extrusion press and accumulator station by the government owned brass plant in Ankara, Turkey.

Underway . . . RUST FURNACE CO. is constructing a new continuous pipe annealing furnace for McWane Cast Iron Pipe Co., Birmingham, Ala.

New Moniker . . . The name of Carbon Malleable Casting Co., Inc., Lancaster, Pa., was recently changed to PENNSYLVANIA MALLEABLE IRON CORP.

University Influence . . . UNIVERSITY OF WISCONSIN, Board of Regents, gave its final approval to a contract between the University and the governments of U. S. and India for a college engineering-improvement course to be given by American educators.

Open For Business . . . STEEL SALES CO., a new scrap brokerage business, opened at 210 Hazel Drive, Pittsburgh, on July 1.

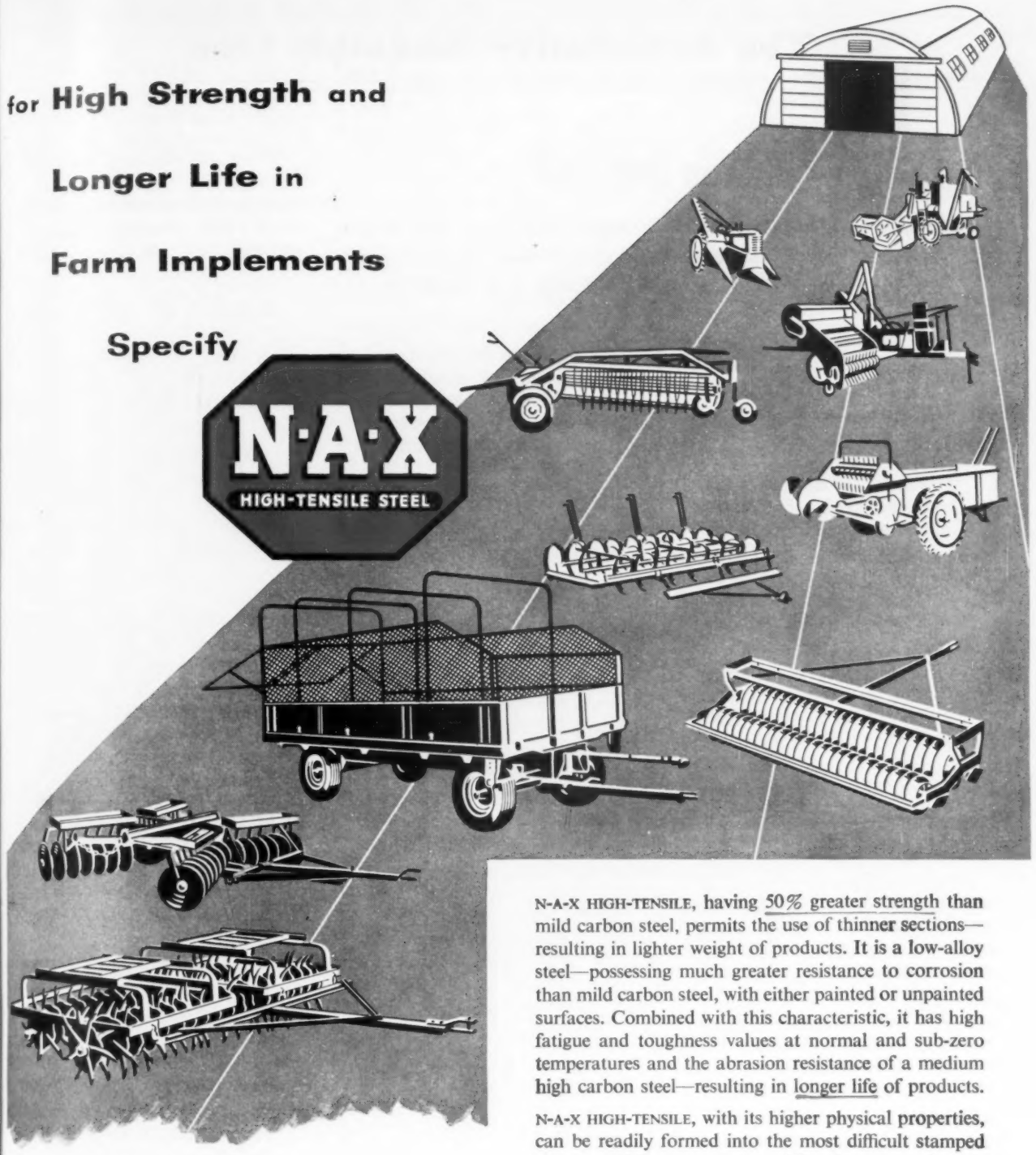
for **High Strength** and

Longer Life in

Farm Implements

Specify

N-A-X
HIGH-TENSILE STEEL



N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made stronger . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify N-A-X HIGH-TENSILE STEEL
... And "MAKE YOUR PRODUCT LAST LONGER"

KEEP YOUR SCRAP MOVING TO YOUR DEALER

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division **Ecorse, Detroit 29, Michigan**
NATIONAL STEEL CORPORATION

Is It Boom or Bust in Detroit?

Some auto plants run overtime while others lay off workers . . . Sales must slump eventually . . . Defense cutbacks hurt . . . But major firms fight for market—By R. D. Raddant.

Detroit is accustomed to a fast transition from boom to bust and vice versa. But the situation today, reflecting at the same time both boom and bust, has the experts stymied.

On one side of town night work and overtime are the rule. On the other side layoffs are coming up or have occurred already. Some plants are upping their production. Others are curtailing it. Some are talking about new production records still to come while others use the word "stretchout" to explain slowing production.

It Can't Last . . . But here's a tip. If you are looking for a job, don't come to Detroit. You can probably get one in a hurry today, and maybe next month, but don't wait until Fall. This isn't to give the impression that Detroit is a ghost town or apt to become one.

But the auto market can't keep it up forever. And defense cutbacks have placed the handwriting on the wall for some 15,000 workers whose jobs are directly connected to the guns side of the so-called guns-and-butter economy.

Recruit for West . . . Possibly one of the best indications of the present situation is the fact that labor recruiters are operating in Detroit. This is a reverse twist for a town that in the past reached into the hills.

The labor recruiters, however, are only after skilled workers who still carry a premium. They are mostly from Los Angeles and other aircraft centers where skilled labor is a critical problem.

Get New Jobs . . . The labor hunt today centers in Willow Run's neighborhood where more than 13,000 workers were laid off. Most of them received their discharge slips with little warning when the Kaiser cargo plane contract was abruptly cut short. But Kaiser's layoff list also includes about 2200 auto workers who can't blame the Air Force for their job loss.

Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
July 18, 1953...	148,417	28,083
July 19, 1953...	142,112	25,448
July 19, 1952...	27,710	4,758
July 12, 1952...	58,710	12,019

*Estimated Source: *Ward's Reports*

On the bright side, about half of 9600 Kaiser employees who were laid off in one big sweep found jobs within 2 weeks, according to estimates of the Michigan Employment Security Commission. The agency said that 4600 Kaiser workers asked for unemployment benefits the week after the mass layoffs, but only 200 claims were filed the second week. MESC referred over 1500 Kaiser employees to other jobs.

"Hot as hell today."

Other layoffs have occurred at Chrysler and DeSoto; are attributed by management to stretching their 1953 programs because of probable delay on new models.

Hunt Fall Jobs . . . Elsewhere in the auto industry Nash will remain down most of this month, a period of idleness brought on by the Borg-Warner strike, will close again in August for an annual vacation period and again in September when model changeovers are planned. This, of course, is not a Detroit operation, but reflects the industry picture.

On the defense side, at least 7500 Detroit area workers will be looking for jobs in the fall when the $500-million cut in the tank and truck programs starts taking effect. A total of 15,000 defense workers will be laid off by next spring.

Return to Kitchen . . . It remains to be seen just what the total effect will be on Detroit's economy. Considering the total employment of the area, these figures, substantial as they are, do not necessarily mean a serious condition.

Many of them will drop from the labor market. Housewives for example, who have been lured from the kitchen by the excellent wages and the ease of getting a job.

This, in turn, has its serious side, if carried far enough. A lot of the tremendous purchasing of cars and particularly appliances this year has been attributed to a second paycheck in the household. While the wife's return to household duties may not be a hardship, it certainly wreaks havoc with family purchasing power.

Makes Over Half . . . It hasn't been publicized, but General Motors walked off with better than 50 pct of the industry production in June, a terrifically high figure for even this industrial giant.

During that month Ford and in-

dependents were hard hit by supplier strikes, giving GM the opportunity which it immediately capitalized on by grabbing off more than half the market.

Fight for More . . . Throughout the industry, GM and Ford, as well as Studebaker among the independents, are not confronted with a serious inventory problem. From here on it will be a no-holds-barred fight between Ford and GM to hold or increase their percentages of the total market.

That is the real story behind the extra shifts, new daily records, and the bigger schedules laid out by these companies through the third quarter, in spite of advice from Washington, the Bankers, and even the UAW-CIO to take it easy.

Who Will Get New Tank Contracts

One of the sidelights of the cutback tank-truck program that is causing a lot of speculation in Detroit is the competitive bidding that will now develop for future contracts. Orders will now be placed with one source and on the basis of competitive bidding.

Topic of chief interest is the M-48 medium tank program currently shared by Chrysler at its Newark, Del., plant, Fisher Body at Grand Blanc, Mich., and Ford's tank plant. Ford's program is already coming to a close and Ford probably will not be a factor in future contracts. A pricing duel is expected between Fisher Body and Chrysler.

It will be difficult to make a prediction on who will be the low bidder. Both Chrysler and Fisher Body know how to produce.

Best guess is that the contract will go to the manufacturer who wants most to stay in the tank business. If that is the case, it seems likely that Chrysler will shave its bidding to get the contract. There's nothing official on it, but it appears that Chrysler makes more of its tank program. Furthermore, Robert Keller, son of K. T. Keller, chairman of the board of Chrysler, is general manager of the tank plant.

Tank Transmissions Roll Off Line

An idea of how defense tooling works is supplied by Buick's production of the CD-850 cross-drive tank transmission, a 3000-lb item with a mere 4000 parts.

Buick last week completed its 5000th transmission, 23 months after the first unit came off the assembly line. But the point is that Buick could now build 5000 in less than 3 months, if conditions demanded it.

Contract was awarded in January 1951, and the first unit was shipped for testing 8 months later.

Enameling Replaces Galvanizing

Goodyear Tire & Rubber Co. has developed a material that is replacing galvanizing in preventing corrosion on some of the company's rim production.

Galvanizing has been the conventional method of coating rims for truck, trailer, and farm implement wheels. Goodyear contends that its new material, known as Bond-A-Coat, has been more successful than galvanizing and that all rims now supplied the Army by Goodyear are now coated with Bond-A-Coat.

In the process, the rim is thoroughly cleaned, then bonderized. When dry, the rim is given a coating of heat-drying enamel, baked on to provide a tough surface. Goodyear says that rims finished by this method can be stored in the open for long periods without fear of rust or discoloration. Finish itself is a bright, hard aluminum finish similar to zinc plating.

Army Emphasizes Medium Tank

Medium tanks, under existing Army policy, will remain the basic weapons of U. S. armored striking forces.

This fact was made clear last week when the Army announced that no more heavy T-43 tanks will be built after Chrysler Corp. completes its production contract at Newark, Del., next spring. Cutbacks have also been ordered in the output of M-48 mediums (THE IRON AGE, July 16, p. 89) but some production will continue.

THE BULL OF THE WOODS — By J. R. Williams

VASS MOX DU, CARL? VASS ISS LOHSE MIT?
FROM DIS ISS VON TOOT BRUK OUT, NO?
A GUY WITH A NEW FOREIGN HELPER ALWAYS THINKS IT'S A DANDY TIME TO LEARN A LANGUAGE AN' SETS TH' GUY BACK LEARNIN' OURS!
THAT'S WHAT'S MADE OUR LANGUAGE, THOUGH--NEITHER ONE OF 'EM GETS IT QUITE RIGHT AND YOU HAVE A NEW LANGUAGE...LIKE MINE, FER INSTANCE!
7-24 J.R.WILLIAMS
THE HANDICAPPER
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Cobalt Chrome . . . for long-run dies, possesses superior abrasion resistance, holds a super keen cutting edge.

Select B . . . a 5% chromium air hardening die steel, easily machined, long wearing, has maximum toughness.

Olympic . . . a die steel perfectly balanced for toughness, wear resistance and machinability, popular for intricate cold work applications.

GSN . . . the oil-hardening steel in this group, combines high hardness and compressive strength with excellent wear.

BR-4 . . . a "bear for wear"—this patented super abrasion resistant die steel provides the ultimate in wear resistance.

The cost of the finished dies you make or use is far too great for you to gamble with expensive failure during or after fabrication because of inferior raw materials. Avoid this risk—specify "DESEGATIZED" die steels for your next cold work dies.

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Foreign offices in:

BRUSSELS PARIS GENEVA MILAN ROTTERDAM

Industry Will Pay More For Postage

Parcel post rates will go up in October; direct mail may cost more too . . . EPT extended "as is" . . . Small Business may replace RFC . . . Auto demand seen solid—*By G. H. Baker.*

Higher rates on nearly every class of mail may confront business and industry next year.

Increased parcel post rates have been approved by the Interstate Commerce Commission, and are to go into effect October 1. The Post Office Department, extending its campaign to end mounting deficits and get itself on a pay-as-you-go basis, now wants Congress to approve higher rates on other types of mail.

Hit Publishers Too . . . Under proposals now being studied at the Capitol, nonlocal first-class mail would be increased from 3¢ to 4¢. Airmail would rise in cost from 6¢ to 7¢. Direct-mail advertising such as circulars and other matter mailed in bulk under the third-class rate, would cost an extra cent per item.

Publications moving under second-class rates are listed for a 42 pct increase—25 pct in October and another 17 pct in July, 1954. These proposed increases replace an earlier scheduled increase of 10 pct in April, 1954, thus virtually forcing increases in advertising rates in many instances.

Air Mail Grows . . . High cost of moving mail by rail has prompted the Post Office Department to experiment with all-air transportation between selected points. During the next 60 days, all New York-Chicago mail is scheduled to move exclusively by air.

Postal economists believe the results of these tests may show that it would be cheaper for the government to move all its first-class mail by air. Trucks and railroads will continue to get more business, the Post Office reasons, because the volume of mail is growing.

Ike Wins EPT . . . Extension until the end of 1953 of the controversial excess-profits tax became official last week with President Eisenhower's signature. Final congressional endorsement came after the Senate voted down an attempt to write relief provisions for small business into the profits levy.

Passage of the tax bill is a victory for the Eisenhower Administration in the first real test of White House influence upon Congress. Extension of the tax had been denounced at the Capitol as an invitation to business disaster. But President Eisenhower and Treasury Secretary George M. Humphrey scored a winning point in citing the Administration's urgent need for the $800 million in revenue the tax law is calculated to yield during the current fiscal year.

Stays "As Is" . . . Senator Williams, R., Del., had sought Senate approval of an amendment to the profits bill which would have increased the exemption for smaller firms from $25,000 to $100,000.

His proposal went down to a 52-34 vote defeat, thus insuring the 6-month extension of the tax on an "as is" basis. The new law also is retroactive to June 30, 1953—the date on which the previous authority for imposing the 82 pct tax expired.

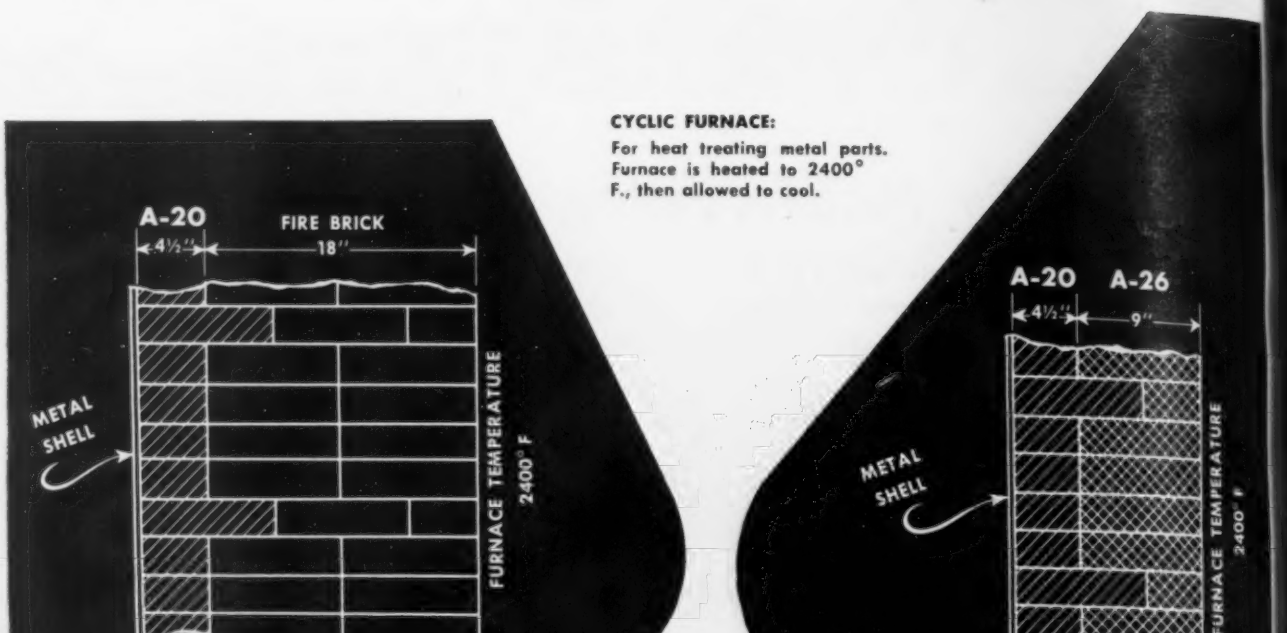
Knell for RFC . . . Reconstruction Finance Corp. may be going out of business sooner than it thinks. Congress has already made it clear that it intends to write off RFC by July 1, 1954, at the latest. But Treasury Secretary Humphrey and Commerce Secretary Weeks have almost succeeded in convincing Congress that business firms' borrowing requirements can be more efficiently met by the projected Small Business Administration.

Would Limit Loans . . . SBA, as it is now projected, is to operate as an independent agency offering funds and advice to smaller firms. Mr. Weeks has made it clear, however, that he believes the agency should be set up within his Department of Commerce so as to avoid overlapping of operations between SBA and the established advisory boards and offices of the Commerce Dept.

Secretary Humphrey believes the amount of money to be loaned by SBA to any one borrower should be limited. He would like to see a $100,000 limit, but suggests that he will go along with Senator Capehart's proposal to set the limit at $200,000 in cases in which the banks assume half the risk.

A market study by Federal Reserve Board finds consumers in a mood to buy autos. And there are indications their feeling that "now is the time to buy" may hold for the next 12 months.

This promising outlook squares with industry sales experience so far this year and expectations for the future. But it doesn't mean that record auto output won't saturate the market.



CYCLIC FURNACE:
For heat treating metal parts. Furnace is heated to 2400° F., then allowed to cool.

Which furnace wall lowers heating costs?

This cyclic furnace illustrates how a change in wall construction can effect great savings in heat loss and fuel costs.

In one construction, the furnace is lined with 18" of regular fire brick and backed with 4½" of Armstrong's A-20 Insulating Fire Brick. Here, the heat loss through the walls is 427 BTU's per square foot per hour. The heat storage is 104,205 BTU's per square foot of wall area.

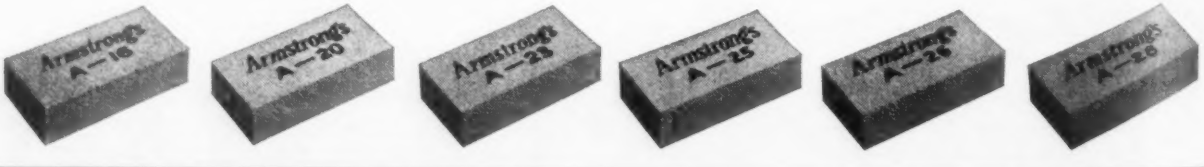
In the second design, the 18" of regular fire brick have been replaced with only 9" of Armstrong's A-26 Insulating Fire Brick. The high refractoriness and spalling resistance of A-26's allow them to be exposed directly to the furnace atmosphere. The back-up is still 4½" of Armstrong's A-20. Heat loss is now reduced to only 338 BTU's per square foot per hour—a savings of approximately 20%.

There's an important reduction in heat storage, too. The A-26 insulating brick cuts heat capacity to only 19,933 BTU's per square foot of wall area —a decrease of about 80%. This saves fuel that would otherwise be needed to heat up the walls. The furnace is brought to operating temperature more quickly and economically, and cools more rapidly. This faster heating cycle increases production substantially.

DO YOU HAVE A FURNACE PROBLEM?

Getting top operating efficiency from a furnace calls for a sound knowledge of brick performance and furnace construction. That's why it's a good idea to call in your Armstrong engineer on your refractories problems. He'll be glad to help you select the best brick for your particular job.

For his help, just call the nearest Armstrong office or write Armstrong Cork Co., 2707 Susquehanna St., Lancaster, Pa.



ARMSTRONG'S INSULATING REFRACTORIES

MATERIALS: Snarl Buying Plan Extension

Time is running out on legislation to extend government purchase program for tungsten, other strategic materials . . . Two bills proposed . . . No conflict.

It appeared last week that proposed legislation designed to add 2 years to the life of present government purchase programs for tungsten and certain other strategic materials would be by-passed until next year.

Reason for the probable postponement is the slow-moving legislative procedure rather than any real opposition to the proposals. Main problem is which of two bills to enact.

One, already passed by the House (H. R. 2824) authorizes extension of the present 1956 termination date for tungsten purchase programs to 1958.

Continuation was declared necessary not only because domestic production is still below domestic consumption levels, but because stockpiling needs are only one-half filled.

Need Government Backing

Last year, domestic mine output was listed at 1792 tons of 60 pct contained tungsten. Consumption, even under controls, was 2268 tons, which meant sizable tonnages had to be imported.

Indications are, according to congressional sources, that with government backing through 1958 the U. S. could become self-sufficient as far as tungsten is concerned.

On the Senate side, however, after committee hearings, the group switched the language of House-passed bill to the extent that it isn't much different now from the Senate bill, S. 1620.

Termination Dates Vary

Main change as approved by the Senate committee is that the measure now provides for a 2-year extension of the purchase programs for manganese, chromite, mica, asbestos, beryl, and columbium-tantalum bearing ores as well as for tungsten.

Present termination dates are: For chromite, mica, and beryl, June 30, 1955; for asbestos, Oct. 1, 1955; for tungsten and manganese, June 30, 1956; for columbium-tantalum, Dec. 31, 1956.

How Much Is Needed

General Services Administration reported to Congress that in order to obtain the 3 million short ton units of tungsten needed by the termination date, metal would have to be delivered at a rate of 600,000 tons a year.

There is no reason to believe the House would not accept the revised version of its bill, but time is running out as Congress drives for an early adjournment.

Through last week, no provision had been made to bring the bill before the Senate. Even after Senate approval, the House might not be able to find time on its crowded calendar to bring up the matter.

Need More Pure Water Projects

Municipal investment in water pollution control projects is at a high rate, but the U. S. Public Health Service says expenditures still are "far below the amount needed to conserve the nation's clean water resources."

Figures just released by the agency show the amount spent in the first 3 months of this year for 119 sewage treatment projects was about $41 million. Dr. Leonard A. Scheele, USPHS Surgeon General, called the investment a slight increase over last year's expenditures for the comparable period, but he added:

"Many more cities and towns need to follow the example of these 119 municipalities in solving their own local problems if the total national problem is to be solved."

Of the 119 projects, 61 were for construction of new sewage treatment plants, 48 for enlargement or improvement of existing plants, and 10 for the building of interceptor sewers.

The Western Gulf drainage basin was the site of 21 of the first-quarter contracts. The Ohio basin was the site of 14, the upper Mississippi 13, and the Southeast 11.

Contract awards were reported in 34 states and the District of Columbia.

"If you won't take my word for it, call the business agent and see what they say about apprentices."

No Renegotiation on Stock Items

Stock items held by defense subcontractors will continue to be exempt from renegotiation by the government until Dec. 31, 1953, the Renegotiation Board has decided. Result of the new ruling is an extension of the board's earlier policy of omitting renegotiation of subcontracts for items placed in a purchaser's stock that are not specially purchased for use in performing renegotiable contracts.

The board warns that it intends to scrutinize contractors' renegotiation filings to make certain the exemption is applied according to its terms. Problem of segregating subcontractors' sales will also be closely studied.

Study U. S. Record Microfilming

General Services Administration has contracted with Records Engineering, Inc., Washington, D. C., management firm, for a $37,900 survey on how the government can use microfilm to store records.

Microfilming is estimated to cut down storage requirements by about 99 pct. But estimates to date indicate that the cost would be as high as $3 million a year.

Looking for a special "character" in Spring Steel, to improve your product?

Check with Sandvik

Wherever spring steel *performance* is vital, it pays to look into the "character" of the steel you specify. By "character" we mean the inherent quality of the material which enables it to meet tough physical demands.

Sandvik Swedish strip steels have a special "aptitude" for tough applications. (For example, take a look at the partial list below). The extraordinary "character" of Sandvik steel results from a basic purity of raw materials, plus specialized methods and close control maintained throughout processing. This assures consistent, successful performance coil after coil, lot to lot.

Sandvik cold rolled high carbon strip steel is available:

- **In special analyses for specific applications.**
- **Precision-rolled in thicknesses to fit your requirements.**
- **In straight carbon and alloy grades.**
- **Annealed, unannealed or hardened and tempered.**
- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
- **Wide range of sizes in stock—also slitting facilities available.**

SANDVIK Swedish Specialty Strip Steels are used for Textile Machine Parts such as sinkers, needles, etc. • Band Saws (metal, wood and butcher) • Camera Shutters • Clock and Watch Springs • Compressor Valves • Doctor Blades • Feeler Gauges • Knives such as cigarette knives, surgical instruments, etc. • Razor Blades • Reeds • Shock Absorbers • A Wide Variety of Springs • Trowels • Vibrator Reeds • Piston Ring Segment and Expanders, etc.

Sandvik also supplies high quality Swedish Magnet Iron Strip and Wire for specialized electrical purposes such as direct current relays, electromagnetic brakes, couplings, chucks etc.

Ask your nearest Sandvik office for further information or technical assistance.

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SANDSTEEL SPRING DIVISION • New York • Industrial Springs • SANDVIK SAW & TOOL DIVISION • New York • Saws and Tools

Ask Private Funds for Heavy Presses

Air Force asks Kaiser, Harvey to put up own money to build presses . . . Kaiser unwilling to back Halethorpe project . . . Newark work may go on . . . Others doubtful—*By T. M. Rohan.*

The Air Force last week was attempting to woo back western aluminum firms who lost six of the seven heavy presses cancelled in the June 19 cutback.

On visits to Oakland and Los Angeles last week, Brig. Gen. Kern D. Metzger, head of the project, had the unenviable task of persuading Kaiser and Harvey to put up their own money for the buildings in a new economy move.

Kaiser said it was unwilling to put up the estimated $5 to $6 million for buildings for the Halethorpe, Md., plant. Two 8000-ton extrusion presses had been scheduled for there.

$10 Million In . . . Some continuation of the project at Kaiser's Newark, Ohio, plant is still possible, however. Air Force already has about $10 million invested in 25,000 and 35,000-ton press foundations with equipment on order.

No building or foundation work has been started at Reynolds' Phoenix, Ariz., plant which was to have an 8000 and a 12,000-ton extrusion press. No ground has been broken at Harvey Machine, so continuation there is improbable.

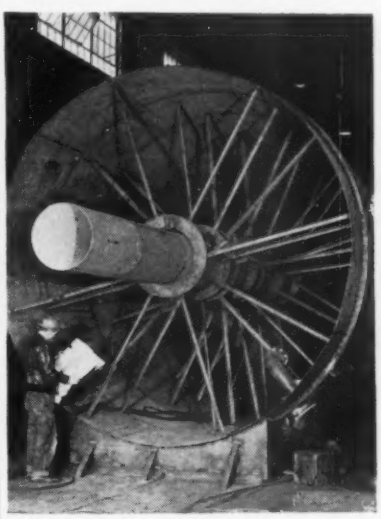
Lafayette Breakdown . . . Gen. Metzger said the press program also suffered an added blow with breakdown of a 5200-ton press at Aluminum Co. of America at Lafayette, Ind., recently. This press will be out for 6 or 7 months and some work will be transferred to Kaiser's 4400-ton unit at Halethorpe and other firms.

Work on the 14,000-ton Schloemann press from Nuernberg, Germany, destined for the Lafayette plant, is being speeded up. This unit is now scheduled to start operation August 1.

Los Angeles Protests . . . The June cutback raised heated protests in southern California, currently the site of 50 pct of all U. S. military airframe output. President Leo Harvey of Harvey Machine said he considered it an "unwise move" to cancel the presses in the heart of the aircraft production center.

Rep. Cecil King of California said, "The necessity of shipping forgings and extrusions from Massachusetts or Ohio to the West Coast does not seem to show a sensible form of economy," and that the West was "being treated as an orphan."

The Los Angeles Chamber of Commerce also issued a formal protest. Los Angeles planemakers said that while development of work for the presses has not progressed to the point where they can be fully utilized, much research work will be delayed.



TITANIC TANK fabricated by Bethlehem Pacific of stainless steel is for Standard Oil's Richmond refinery.

$11 Million More . . . The Yolo Steel project at Sacramento, Calif., showed more signs of life last week.

The firm was granted an accelerated tax write-off on 40 pct of a proposed $11-million electrolytic tinplate line. With the planned $43.7-million blast furnace and $81.2-million steel plant including tube mill, the project now would hit almost $136 million.

Check Needs Closely . . . G. I. Dumond, president, told THE IRON AGE last week he has been in and out of Washington hearings for 18 months. At these, requirements were closely checked by steel consultants. Mr. Dumond likened the project to years of pre-war attempts to promote an integrated southern California steel mill which finally resulted in the war-born Kaiser mill.

Long on paperwork, Yolo has been short on action since first announced in 1950. Latest in long line of target dates for start of construction is 30 to 45 days, when financing plans are also scheduled to be announced.

Frame Hopes Dim . . . Hopes of setting up a western automobile frame plant got a severe setback last week.

A. O. Smith of Milwaukee, a leading frame builder, announced plans for a $5-million plant at Granite City, Ill., to supply 40 pct of Chevrolet's auto frame needs. A healthy part of these will go to California assembly plants of General Motors, leading western producer.

At least two western steel producers have made comprehensive surveys on the possibility of western-built frames. Press manufacturers were consulted and some estimates drawn up.

Preliminary indications were that with some increase in volume, western plants could deliver for $9 less per frame, helped by a freight umbrella.

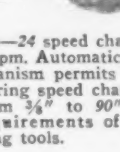
CH MILLING MACHINE COMBINES SPEED, ACCURACY AND POWER

CH MILLING MACHINE FEATURES THAT HELPED DO THIS JOB BETTER

Speeds and Feeds—*24* speed changes from *15* to *1500* rpm. Automatic protecto-mesh mechanism permits non-clash shifting during speed changes. *32* changes from ⅜" to *90"* per minute meet requirements of new metals and cutting tools.

Greater rigidity — Heavily ribbed, box section, sponson construction. Proper weight distribution absorbs vibration.

Greater cutting efficiency through a train of heavy duty, wide-faced, forged steel gears, hardened and specially processed.



Smoother feed performance through a heavy duty 2" dia. table feed screw. 23% greater bearing contact between screw nut for longer screw life and accuracy.

Greater horsepower — independent drives for spindle, feed and rapid traverse, and coolant. 15 hp to spindle . . . *3* hp for feed and rapid traverse... ¾ hp for coolant.

Here's a job handled on a new CH-4 Machine

Job: Menasco Mfg. Co., Burbank, Cal. Straddle Milling Drag Links
Machine: No. 4, Model CH, Plain Style
Part: Shock strut for landing gear cylinder
Cutter: High speed steel inserted tooth
Cutter Speed: 18 rpm, 15/32 ipm feed
Chip Load: .005"
Material: 4140 Steel forging, 43 Rockwell

Investigate the new CH line of milling machines. These and other features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Shift Direction of Machinery Exports

Major export markets for U. S. capital goods have changed rapidly in postwar period . . . Latin America and Canada have replaced Europe as biggest buyer—By *E. C. Beaudet.*

The rapidly changing pattern of postwar export markets is causing American producers of capital goods to look North and South rather than East and West in their search for new foreign business.

Since World War II Latin America has replaced Europe as the largest purchaser of American capital goods. Canada is a close second, and if it continues its present buying pace may soon replace Latin America in the top spot.

Are Most Important . . . Foreign buyers purchase 11 pct of all U. S. capital goods sold, and of all types of U. S. capital goods exports, machinery and equipment make up the largest group.

According to the Council for Technological Advancement, the $3 billion worth of capital goods exported last year accounted for 20 pct of total exports and 25 pct of all non-military exports. This makes capital goods the fastest expanding group in the entire export list.

Metalworking Is Different . . . While Latin America and Canada have become the major markets for most U. S. capital goods, metalworking machinery (including machine tools, steel mill and foundry equipment, presses) still depends mostly on Europe which accounted for 66 pct of foreign purchases of this equipment. Canadian buying accounted for 16 pct, Latin America, 10 pct.

A favorable balance of trade and fairly large private American investments north of the border have made it possible for Canada to finance its rapidly growing volume of machinery imports which have increased from a volume representing 15 pct of total U. S. exports in 1938 to 28 pct in 1952.

What They Buy . . . While all types of machinery share in the expanding Canadian demand, greatest advances have been made by construction, mining and agricultural equipment. Since 1938 Canadian imports of mining and construction equipment increased seven times and have doubled since 1948. Electrical machinery sales have also doubled in the last 4 years.

Imports of metalworking machinery, although expanding at a slower rate than other equipment, have increased considerably.

Demand Drops . . . Latin America remains the biggest foreign buyer of U. S. machinery despite a 15 pct drop since 1948. Up to that year it had been our fastest growing postwar capital goods market, as volume of machinery and equipment imported from America was 4.5 times as much as in the prewar period.

Leading in this expansion was metalworking machinery, engines and turbines, which increased six times by 1948. Market for agricultural machinery and tractors continued rising through 1951 and then tapered off.

Despite the recent decline, Latin American countries bought more U. S. machinery than any other country last year, with dollar volume of imports totaling $960 million.

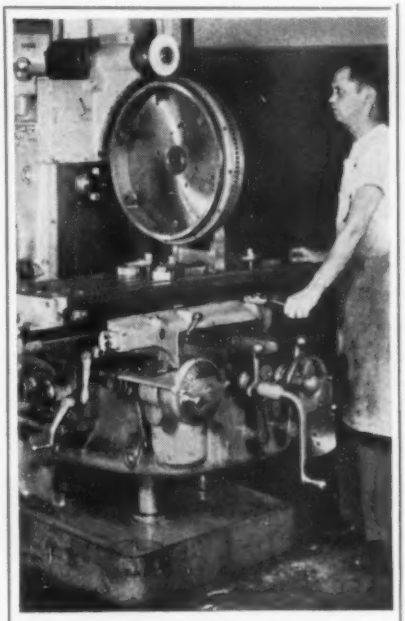
Dollar Lack Hurts . . . Europe's loss of leadership as our biggest foreign purchaser of capital goods is shown by the fact that in 1952 it purchased $620 million worth of machinery and equipment as compared to Latin America's $960 million and Canada's $840 million. The drop is due largely to postwar recovery problems and the dollar shortage.

Tapering off of U. S. economic assistance and revival of European competition for the Continental machinery markets are other facts affecting the decline of this export market.

Exceptions to the downward trend in imports were increases in imports of construction, mining and agricultural machinery, turbines and engines.

Exports Falling . . . Volume of all U. S. capital goods exports this year is declining from the 1952 peak, according to CTA's survey. First quarter of 1953 showed a 2.7 pct dip below the same quarter last year. Biggest drops were in office equipment, construction, mining and pumping machinery.

These losses were partially offset by the large gains made by electrical machinery and metalworking equipment.



SLOTS IN MASTER index ring for a special broaching machine are ground accurately on this milling machine converted into an external grinder. Indexing is done by simple fixture made by Ace-Central States Machine Tool Co. Setup saves time.

UDYLITE BRY-CAD

THE NEW BRIGHT CADMIUM PROCESS!

New Udylite Bry-Cad is unequalled in brightness, throwing power, plating speed and covering!

But that's not all! Bry-Cad offers exceptional operating economy, too. It is highly resistant to both organic and metallic impurities. New Udylite Bry-Cad provides high cathode efficiency and operates over a wide current density range with little "gassing" and no spray. This materially reduces waste.

Complicated parts . . . deep recessed . . . intricate shapes . . . are all plated uniformly with new Bry-Cad. And only one liquid brightener is needed for the whole operation.

Have your Udylite Technical Man give you the complete story or write direct. THE UDYLITE CORPORATION, DETROIT 11, MICHIGAN. *West of Rockies, L. H. Butcher Co., Los Angeles 23, California.*

PIONEER OF A BETTER WAY IN PLATING

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

Report to Management . . .

Competition licks inflation bogey

Anyone who still spiels on dangers of inflation is talking through his hat. Barring a new war, you can bet inflationary forces will remain squelched by current orderly but active competition...From your experience in meeting generally spirited demand with a really expanded industrial plant to cater to it, you can see how resulting competition has created a mild price deflation...And were it not for cost increases in steel, aluminum, labor this deflationary tendency would be more pronounced.

BLS steel index rises 7.8 pct

Boosts in base prices and in extras have levered up BLS finished steel price index 7.85 pct from Apr. 21 to July 7...One manufacturer using about 500,000 tons a year figures his steel costs are up 7.8 pct--or $11.50 per ton.

Sales, profits stay respectable

You, too, can probably show how this increase and others have cut your profit margin per unit. But you will probably admit that because you're selling a large volume of goods, total profits and sales stay respectable.

Profits proof market's good

Want proof the market's thriving? Securities & Exchange Commission reports net profits after taxes for major manufacturers in first quarter '53 were 11 pct higher than the same period last year and about even with fourth quarter...General Electric reported sales for its first 6 months as 33 pct and net profits 32 pct over same period '52.

What about manufacturing?

Manufacturers' sales last May were $26,314,000 against $23,247,000 in May 1952, reports Dept. of Commerce. Comparing the same months, book value of inventories was $45,048,000 against $43,144,000. Monthly price index of all commodities as of July 4 was 109.4 against 111.2 for June 1952.

Worker has more to spend

From February through July 1952, a manufacturing worker had gross average weekly earnings of about $66.70. In 1946 you were able to put only $43.82 into his pocket. For the first 4 months this year his average was about $71.50...That helps explain your healthy demand. And expansion of manufacturing, helps explain why there are more products, more competition.

Retail sales keep rising

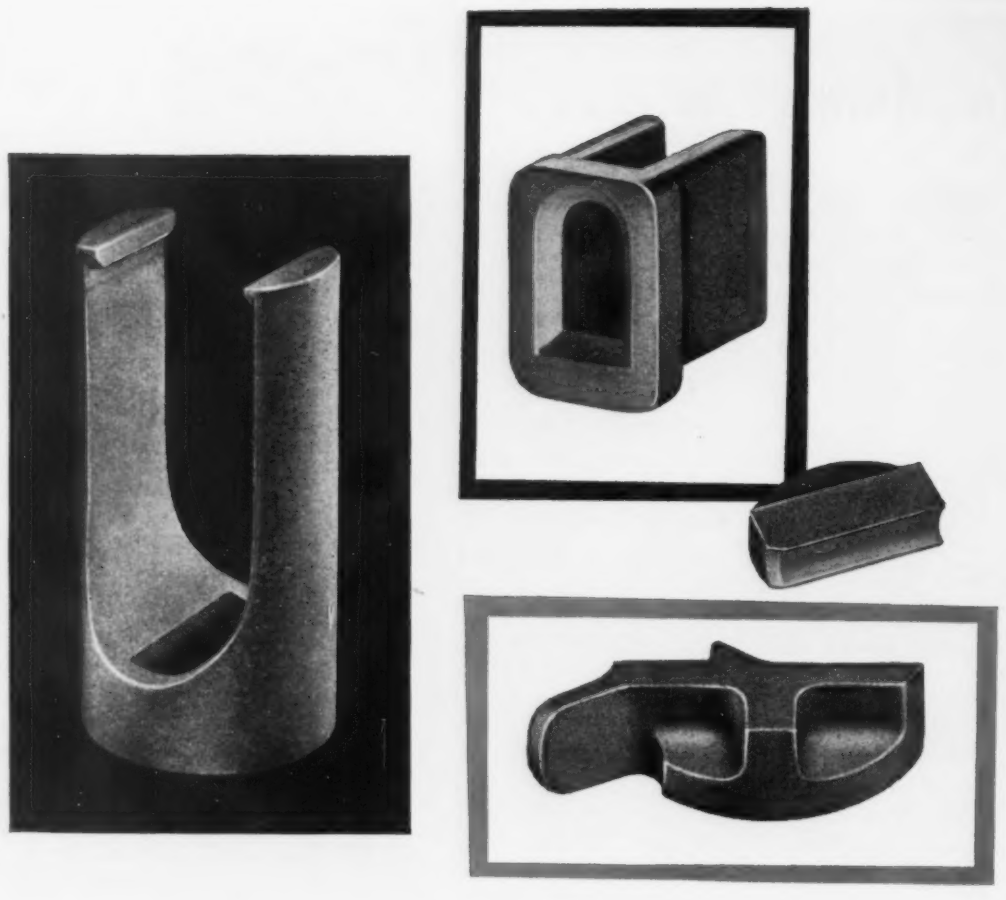
Leading mail order and chain stores had their fifteenth successive monthly increase in sales, New York Times reports. Revenue freight car loadings for the week ended July 4 showed an increase of 14 pct over corresponding week in 1951 and 49.8 pct over the strike week of 1952.

Who can raise product prices?

Today, only those who have the demand and the unhappy lot of narrow profit margins dare raise prices. When steel hiked prices, the furor was minimal...Aluminum raised its prices last week to take care of labor, too. No howl expected...Aluminum output in '53 will likely top 125 million tons as compared to '52 output of 937,321 tons...Not only will current demand eat up all this bonus production but will be strong enough to keep Washington from stockpiling all it wants.

How tough is competition now?

Evidences of competition are abundant. Don't be so foolish as to buy a household appliance without a fat discount...Used car prices have been skidding. Up to 20 pct in 1 year, it's estimated. New car dealers are shading prices while automakers produce to the limit...In machine tools, defense cutbacks have lopped overall order backlogs to below 8 months. Civilian demand's taken up some slack but competition will keep prices stable.



improve product design . . .

cut manufacturing costs

with ACCUMET PRECISION INVESTMENT CASTINGS

In many cases design is restricted and function limited when alloy steel parts are made on conventional machinery from bar stock or forgings. Frequently such designs can be improved and production costs lowered by the use of precision investment castings. That's because this casting process permits the use of high alloy steels that are difficult to machine or forge.

Take these four component parts of a pneumatic tool for example. They are Accumet Investment Castings made by Crucible of 8620 steel. They have a smooth, satiny finish and are held to very close tolerances. If these parts were not made by this "lost wax" process, the pneumatic tool could not be produced at a practical cost in its present design.

Crucible engineers and metallurgists are available to help solve design and production problems through the use of Accumet Precision Investment Castings. Write now, and let them help you solve yours.

CRUCIBLE

first name in special purpose steels

53 *years of* Fine *steelmaking*

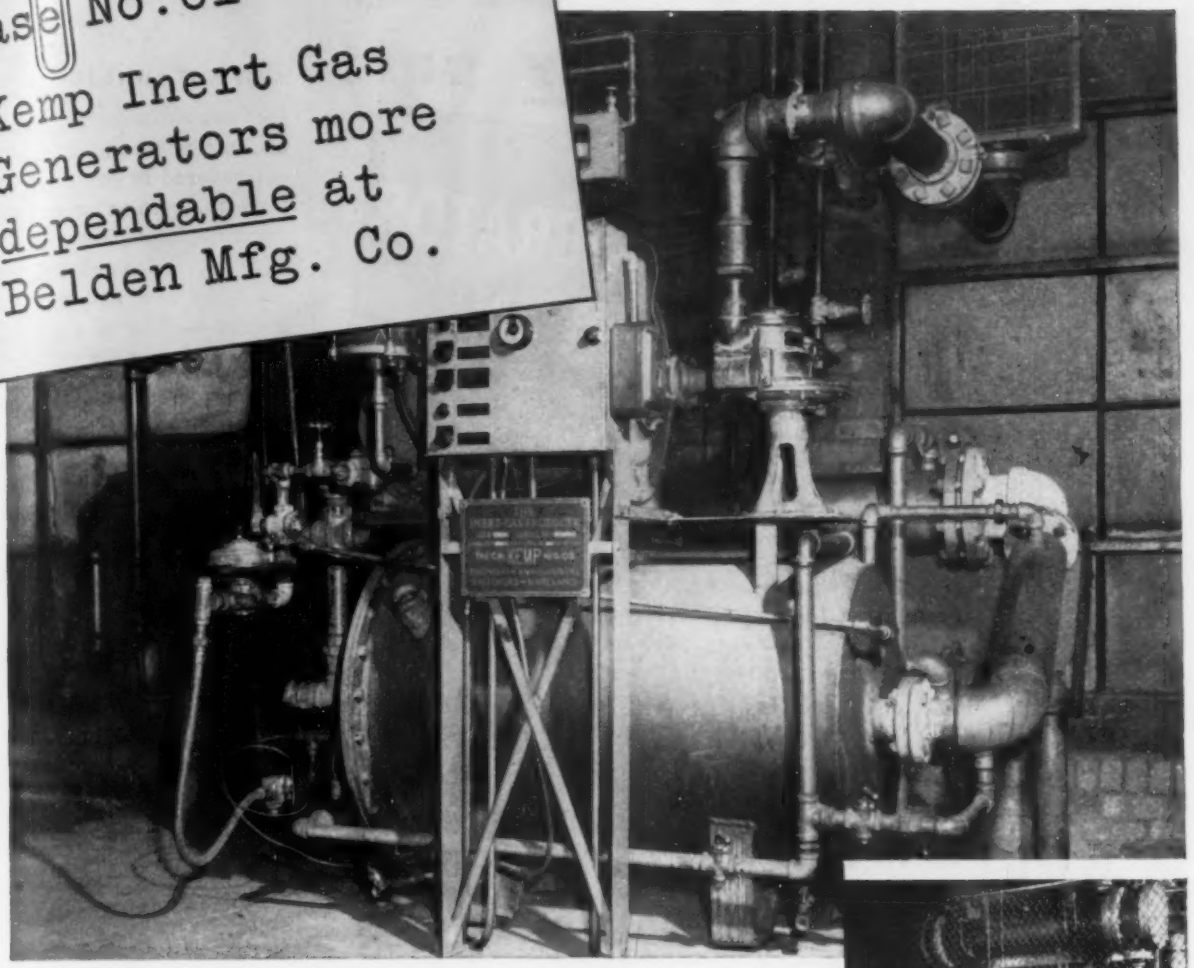
ACCUMET PRECISION CASTINGS

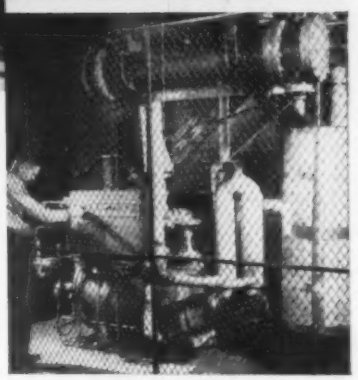
CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

Case No. 61

Kemp Inert Gas Generators more dependable at Belden Mfg. Co.





Generator on first floor of plant is enclosed in wire cage to prevent tampering with controls.

How Belden utilizes two Kemp Generators in annealing copper wire

Annealing copper wire necessitates cooling in an oxygen-free atmosphere to prevent harmful oxidation. For the required protective atmosphere in this process, the Belden Mfg. Co., Chicago, Ill., generates its own inert gas. But the generating equipment formerly used by Belden did not operate reliably . . . results were erratic. So Belden installed two Model MIHE Kemp Inert Gas Generators to handle this important job.

And Kemp *Handles* the Job

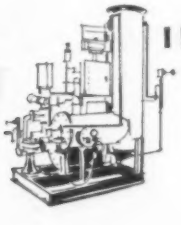
These two Kemp units assure Belden of a *dependable* inert supply. They deliver a more constant flow at the rated pressure . . . have been operating smoothly and satisfactorily since installation. Kemp's ability to produce a chemically clean inert at a *specific analysis regardless of demand* eliminates the danger of fluctuation at a critical stage.

Kemp Units Engineered for Service

Like Belden, you specify reliability when you specify Kemp. Every Kemp design includes the Kemp Industrial Carburetor for complete combustion without tinkering, without waste . . . for simplified installation and maintenance. Every Kemp design includes the very latest fire checks and safety devices. Annealing, hardening, sintering—whatever your problem, find out today how Kemp engineers can help you.

For more complete facts and technical information, write for Bulletin I-10 to: THE C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Md.

KEMP OF BALTIMORE



INERT GAS GENERATORS

CARBURETORS • BURNERS • FIRE CHECKS
METAL MELTING UNITS • ADSORPTIVE DRYERS
SINGEING EQUIPMENT

SAVE HOURS

reconditioning any part

with WHEELABRATOR® AIRLESS BLAST CLEANING

A Finnell floor maintenance machine prior to reconditioning.

90% saving in labor costs

88% faster cleaning

RESULTS FROM INSTALLATION AT FINNELL SYSTEM, INC.

In reconditioning floor maintenance machines a Wheelabrator cut cleaning time from 8 hours to less than 1 hour per machine at Finnell System, Inc.

Only 5 minutes were required to clean these parts with the Wheelabrator.

Reconditioning of metal parts is a big and profitable business. It can be made more profitable when the airless Wheelabrator is used for removing surface corrosion such as rust, dirt, old chipped paint, etc. A quantity of parts requiring several hours to clean by costly, laborious methods can be restored to original surface cleanliness in minutes with the Wheelabrator blast cleaning process. It's rapid and thorough low-cost cleaning creates new profit possibilities in the reconditioning of trade-ins and leased machinery, auto parts, electrical equipment, pipe, structural steel, gas cylinders, etc.

Wheelabrator equipment is an investment with a quick return. Write for details for your reconditioning problem.

Catalog 74-B tells "What the Wheelabrator Is and What It Will do for you." Send for a copy today

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WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT

—Free Publications—

Continued

Boring, milling

DeVlieg's Spiramatic Jigmil Precision Boring and Milling machines are covered in detail in a new 23-p. bulletin. An extremely versatile machine, the Jigmil is said to be effective on production work or one-piece jobs and may be used for a wide variety of production parts such as gear cases, aeronautical parts, and component parts of special types of machinery. *DeVlieg Machine Co.*

For free copy circle No. 14 on postcard, p. 83.

Motors, generators

As an aid in selecting motive power, Allis-Chalmers has made available a 50-p. reference booklet on motors and generators. The material was reprinted from the 1952 edition of Lincoln's *Industrial-Commercial Electrical Reference. Allis-Chalmers Mfg. Co.*

For free copy circle No. 15 on postcard, p. 83.

Product folder

Stephens-Adamson has put out a new folder on some of its industrial products. Included among the items covered are: Centrifugal loaders, car pullers, bin level controls, hoists and winches, speed reducers, conveyor belt cleaners, holdbacks and carriers. *Stephens-Adamson Mfg. Co.*

For free copy circle No. 16 on postcard, p. 83.

Conveying buckets

Features and specifications of Farrell-Cheek's alloy cast steel elevating and conveying buckets are given in a new bulletin. Patterns are carried for all standard sizes. *Farrell-Cheek Steel Co.*

For free copy circle No. 17 on postcard, p. 83.

Free analysis

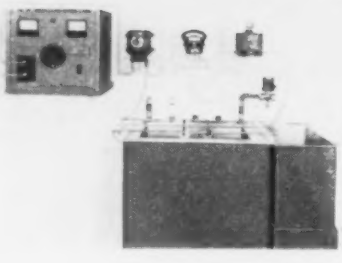
Fischer & Associates has published a foundry checklist and offers to anaylze without obligation a plant's foundry operations from answers given to the questionnaire. The checklist may be used by both ferrous and nonferrous foundries. *Fischer & Associates.*

For free copy circle No. 18 on postcard, p. 83.

TOUGH STUFF
Axelson lathes make your tough jobs easier, delivering constant precision work, even under the most difficult operating conditions. This chip, a sample of the rugged cuts Axelson lathes can make, is from a ship shaft of #6140 chrome vanadium alloy steel, 13½" in diameter. Cut was made at 66 s. f. m., feeding at .050 per revolution; depth of cut 1". Tough stuff? Sure, but it's easy when you use an Axelson lathe.
WRITE FOR AXELSON LATHE BULLETIN #5001
Chosen first ... to last
PSC
AXELSON
THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY
Lathes
TOOL ROOM LATHES • GAP BED LATHES • HEAVY DUTY ENGINE LATHES
AXELSON MANUFACTURING COMPANY • Division of Pressed Steel Car Company, Inc.
Los Angeles 58 • New York 7 • St. Louis 16
Authorized Distributors
in All Principal Industrial Centers

NEW EQUIPMENT

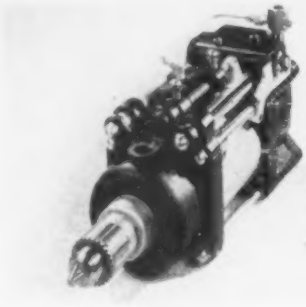
New and improved production ideas, equipment services and methods described here offer production economies . . . just fill in and mail the postcard on page 83 or 84.



Package unit for plating of gold and rhodium

A complete fully controlled package unit for the precision plating of gold and rhodium has a capacity of 40 gal. It offers fully automatic timing, heat control, individual power source and indicating metal replenishment control. Standardized soluble gold and rhodium of highest purity is available for use with this unit, together with procedure for plating any thickness of gold, gold alloy or rhodium. *Technic, Inc.*

For more data circle No. 19 on postcard, p. 83.



Automatic air drill has adjustable stroke to 4 in.

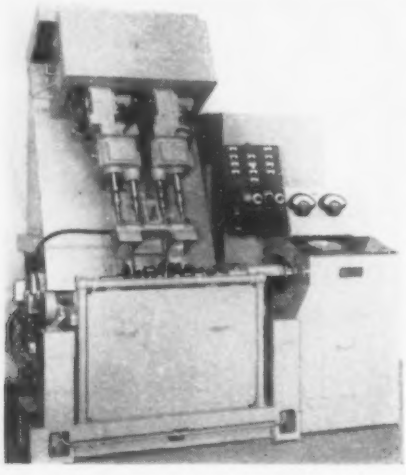
Holomatic drilling unit weighing 30 lb accomplishes single and multiple feed rate operations. Powered by compressed air, hydraulically fed, it is suitable for automatic or manual cycle control. The stroke is adjustable to 4 in. with ample thrust for ½ in. diam drilling in steel. Positive stop with a dwell or instantaneous retract operation; continuous cycling, skip drilling, back feeding and manual jogging are easily achieved. Rotary air motors available to ¾ hp, speeds 500 to 15,000 rpm. Units can be mounted in horizontal, vertical or angular planes. *Hause Engineering.*

For more data circle No. 20 on postcard, p. 83.

Hydraulic rotating device fits fork trucks

Compact, hydraulically-operated load revolving mechanism for use on Elwell-Parker hydraulic fork trucks permits 360° rotation. It is designed for use in conjunction with fork truck attachments: forks, roll paper clamps, up-enders and other load supporting devices. Trucks so equipped are suited for discharging contents from skid bins and other containers, for positioning loads for storage, and for ease of loading and unloading. Power is supplied by hydraulic motor. *Elwell-Parker Electric Co.*

For more data circle No. 21 on postcard, p. 83.



Unbalance of crankshafts obtained automatically

Amount and angular location of dynamic unbalance in automotive crankshafts are automatically obtained, and holes of the required depth are drilled in the crank counterweights on the Tinius Olsen balancing machine. The machine consists essentially of a standard dynamic balancing machine in combination with two drilling heads and a special fixture. Electronic devices and servo-mechanism are provided so that a crankshaft can be automatically balanced without being removed from the machine. The Electrodyne unit gives the angular location and dynamic unbalance, and transmits its electrical signals to set the drills for correct depth of holes and reference pointers which indicate the angle of unbalance. The operator need not take readings or physically set the depth to be drilled. Automatic compensation provides for variations in machining and drill wear. *Tinius Olsen Testing Machine Co.*

For more data circle No. 22 on postcard, p. 83.

Turn Page

You Name The Shape—We'll Fabricate The *Special Tubing* You Need!

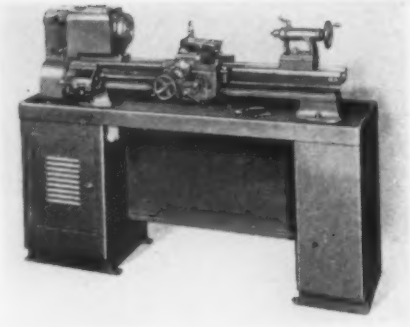
Want to cut your specialty tubing costs, eliminate fabrication difficulties and *still* get special tubing with the kind of top uniform quality you'd demand from your own plant? Sounds like a big order, but you can depend on exactly that when you buy Summerill Specialty Tubing.

Summerill has over 50 years experience in the manufacture and fabrication of cold drawn seamless steel specialty tubing. Our plant is completely equipped to produce tubing from the various carbon and alloy analyses in practically any special or intricate shape that you need. And you can count on us to adhere strictly to your specifications. ● Why not drop us a line today outlining *your* tubing problem? *Summerill Tubing Company Div., Columbia Steel and Shafting Company, Pgh. 30, Pa.*

"Miking" specialty tubing. Summerill Seamless Tubing is quality controlled from raw material to finished product.

IN COLD DRAWN SEAMLESS STEEL TUBING

SPECIFY *Summerill* AND BE *SURE!*



Heavy cuts possible on 12-in. lathe

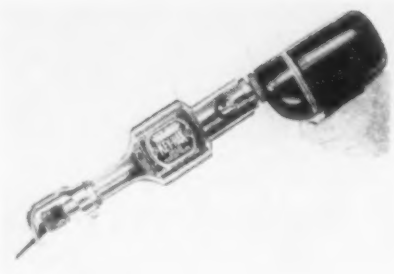
A heavy headstock, double V-belt outboard drive, massively proportioned and ball bearing mounted spindle, and a convenient, precision-built carriage are features of a new 12-in. lathe. Indicative of its capacity are such specifications as the 12-in. swing-over bed and saddle wings, 1-in. collet capacity, 1⅜-in. spindle hole, and center distances of 23 and 35 in. The lathe hogs out heavy cuts, handles high speed production runs, and holds sensitive tool room tolerances. The spindle will provide sustained accuracy through 16 speeds, from 38 to 1260 rpm. *Logan Engineering Co.*

For more data circle No. 23 on postcard, p. 83.

Threading unit is self-contained power package

The new Murchey Precision-Pak threading unit brings to the threading field a fully automatic power unit with such features as direct precision lead, rapid return of the tool spindle, variable speeds, flexibility of application, and low cost of maintenance. Its hardened and ground spindle is driven by a 3 hp motor. Precision lead is maintained throughout the entire feed travel of 4 in. by a quick change lead screw and collapsible lead nut head, mounted directly on the rear end of the spindle. At end of feed travel, lead nuts are automatically disengaged and rapid spindle return is obtained through a planetary gear clutch. *Sheffield Corp.*

For more data circle No. 24 on postcard, p. 83.



Portable power saw has 360° rotability

The Key-Hak attachment fits any heavy-duty ¼-in. electric or air drill or motor driven flexible shaft. It cuts directly, without aid of a starting hole, into 20 gage or lighter sheet metal and into wood of any thickness. In-line mechanism of this precision-built tool affords the operator complete control when cutting in any direction. Ball bearings in the drive and crank mechanism assure smooth operation and maximum tool life. The mechanism is sealed in a special lubricant. *Producers & Distributors, Inc.*

For more data circle No. 25 on postcard, p. 83.

Vacuum furnace provides temperatures to 2500°F

New type high temperature electric vacuum furnace, called Airfre model, has been designed for production and laboratory use where temperatures up to 2500°F and vacuums up to 29 in. are required; higher vacuum for special application can be supplied. Furnace and vacuum system can be used independently of each other. The Airfre furnace is built in different sizes, and is complete with vacuum pump, and other necessary control equipment such as gages, pressure controller, etc. *K. H. Huppert Co.*

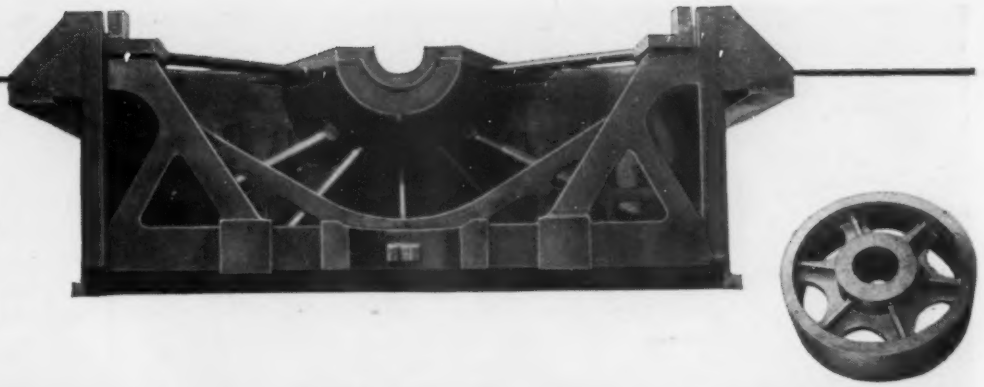
For more data circle No. 26 on postcard, p. 83.

Rock type dump body for heavy duty hauling

Designed to withstand the hard shock of power shovel, chute and conveyor loading, a rock type dump body for hauling abrasive materials is available in 5 to 15 yd sizes. Body is constructed throughout of high tensile steel plate and features extra wide box type side bracing, both horizontal and vertical, on the head sheet and sides. The new rock body design eliminates side bulging. Driver's compartment is amply protected by a sturdy, box braced, full size cab protector. Rock body sides fold into body floor at 45° angle to prevent material from lodging in corners. Dumping is handled by heavy duty hoists. Tailgate is eliminated by scow type rear end. *Galion Allsteel Body Co.*

For more data circle No. 27 on postcard, p. 83.
Turn Page

big
or
small



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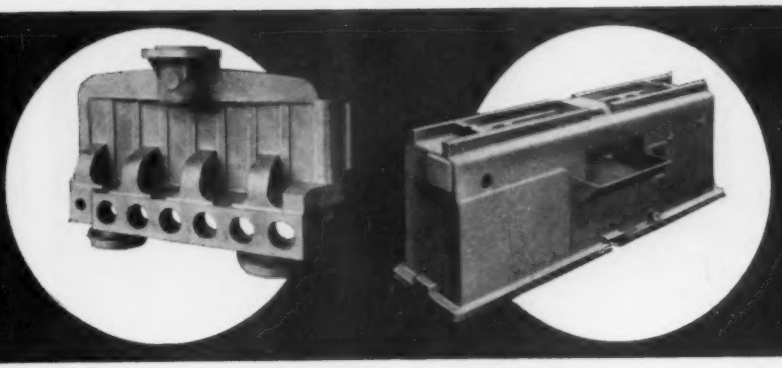

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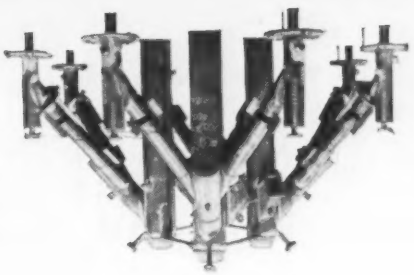

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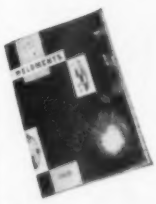
Quality is evident in every Graver job—whether it be a simple or intricate weldment. This is assured by Graver's complete inspection service, extra-large capacity heat-treating facilities for stress relieving, close quality control, plus the employment of the newest welding techniques by highly skilled personnel.

Carbon and alloy steels, aluminum, clad, and stainless weldments are commonplace with Graver. A complete engineering service is at your disposal, and Graver's Weldment Division will re-design your units to reduce manufacturing costs. Graver is equipped to handle thicknesses from 1/4 inch to 12 inches, maintaining closest tolerances.

Look to Graver . . . experts in metal fabrication . . . as *your* weldment source.



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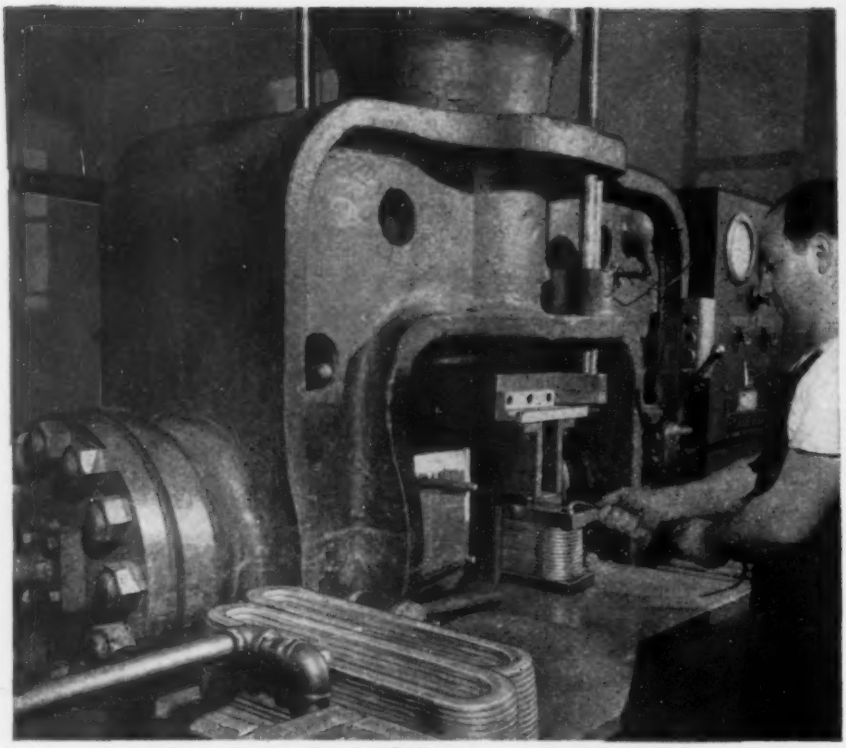

How this 2-way

FARQUHAR Hydraulic Press

forms motor and generator coils

In producing motor and generator coils from ¼ x 1-in. copper stock, the stock is first bent and the ends laminated, and then pressed to restore them to their original thickness. Then, the coil is put in this Farquhar 2-way Hydraulic Press for "pressing" the form.

The coil is laid on a steel block, a three-part filler mandrel inserted, and a top block applied. The press "snugs" the coil sides at low pressure (40 tons); then the vertical ram snugs the top. The operator kicks the pressure-shift pedal, to double vertical-ram pressure for forming.

Capacities of rams are 100 tons horizontally and 200 tons vertically. Illustration above shows operator withdrawing the coil after forming has been completed.

Farquhar Presses Cut Your Costs

The above installation is just one more example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

Farquhar engineers are ready to help solve whatever production problem you may have. Their expert assistance is yours for the asking. Give them a call . . . at no obligation, of course!

Or, send for our free catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry. Write to: THE OLIVER CORPORATION, A. B. Farquhar Division, *Hydraulic Press Dept.*, 1503 Duke St., York, Pa.

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HYDRAULIC PRESSES

for Bending • Forming • Forcing • Straightening • Assembling • Drawing
Extruding • Jogging • Forging • and other Metalworking Operations

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Carbide dies repaired

Tungsten carbide dies can be repaired, altered and even produced from blanks of pre-sintered carbide by using the new Nord Di-Profiler. Operation is vibrationless even when used at long stroke which may be adjusted from 0 to 0.250

in. Accuracy is due to full ball bearing construction and the eccentric balancing construction of high precision. Action is reciprocating and oscillating at will, to the amount desired and when used with the spindle attachment, finely controlled rotary action is obtained. *Nord International Corp.*

For more data circle No. 28 on postcard, p. 83.

Machine setup kit

Setup time and assembly costs are cut with a new kit that contains 24 studs; 4 extension nut couplers; 4 flange nuts; 4 T slot nuts and 4 strap clamps with stud diameters

available in ⅜, ½, ⅝, ¾ in. with 3 different T slot nut sizes available for each stud diameter. Kit can hang on wall or sit on table close to the machine. All parts are heat treated alloy steel with black penetrate finish. *Jergens Tool Specialty Co.*

For more data circle No. 29 on postcard, p. 83.

Turn to Page 95

Vapor degreaser

Combination vapor degreasing unit is capable of performing 200 lb of work per hr either in baskets or as individual pieces. The unit incorporates cool rinse, hot rinse and vapor degreasing: it has both a rinse and boiling sump along with a water jacketed vapor area. Distilled solvent is collected by a condensate return trough, passed through a water separator and returned to the rinse sump. The boiling sump is fed by overflow from the rinse sump. Heating is electrical. Size is 38x18x42 in. Constructed of 14 gage steel. *Phillips Mfg. Co.*

For more data circle No. 30 on postcard, p. 83.

Wire braid air hose

Called Commander, a new heavy duty air hose suitable for working pressures up to 400 psi is reinforced with a single braid of high tensile steel wire and is said to be more flexible than other types of heavy duty air hose. It is designed for rugged service in mines, quarries, construction projects and general industrial use where high working pressures are required. Commander is manufactured in ½, ¾ and 1 in. sizes. *B. F. Goodrich Co.*

For more data circle No. 31 on postcard, p. 83.

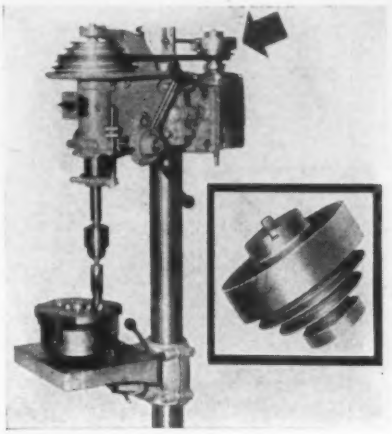
Structural material

Called Aircomb, a new structural material is a honeycomb structure of Kraft paper inpregnated with a phenolic resin. In use it is sandwiched between thin facings of aluminum, stainless steel, magnesium, wood, plywood, plastics, or other materials. It is shipped precut in any thickness from 1/16 to 5 in. in any length desired and is claimed to have unusual strength in relation to its weight. It is durable, fire and pest resistant, has excellent insulation and soundproofing qualities. A piece of steel of equal rigidity is said to weigh 16 times as much as Aircomb. *Douglas Aircraft Co., Inc.*

For more data circle No. 32 on postcard, p. 83.

Speed-reducing pulley

Three new models of speed-reducing pulley make it possible to drill efficiently up to 1⅜ in. in steel on light drill presses with only a ½ hp motor. Models are built ruggedly to provide increased driving



power and machined to finer tolerances greatly increasing their efficiency. Each unit is adaptable to three motor shaft sizes, ½, ⅝, ¾ in., accomplished by means of two reducing sleeves, ¾ to ⅝ in. and ¾ to ½ in. *Pull-Gear Co.*

For more data circle No. 33 on postcard, p. 83.

High capacity battery

Twenty pct more capacity in the same space is the advantage claimed for a new line of T-H Exide Ironclad batteries. The battery, which is essentially the Exide Iron clad using the slotted tube positive plate, with the long life qualities, now incorporates new materials and structural changes to give increased capacity. *Electric Storage Battery Co.*

For more data circle No. 34 on postcard, p. 83.

Turn Page

THE MAN WITH THE ANSWER To Your Handling Problems

He's a good man to know — your P&H dealer. You see, he has much more than just hoists in stock. He also has a wealth of experience in "thru-the-air" handling.

Ideas! That's what your P&H hoist dealer can give you! Shortcuts to help you save time! Methods to make man power go further! He'll be glad to put all his knowledge at your disposal. Ask him into your plant. Let him show you how to save important money every month with modern "thru-the-air" handling.

CALL YOUR NEAREST P&H DEALER OR WRITE—

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HARNISCHFEGER CORPORATION
Milwaukee 46, Wisconsin

ORTON

Torque-Control

MEANS

POWER CONTROL
WEAR CONTROL

- NO JERKING, slip-clutching or racing engines!
- CUSHIONED SHOCK—only the *exact* amount of power needed to move the load!

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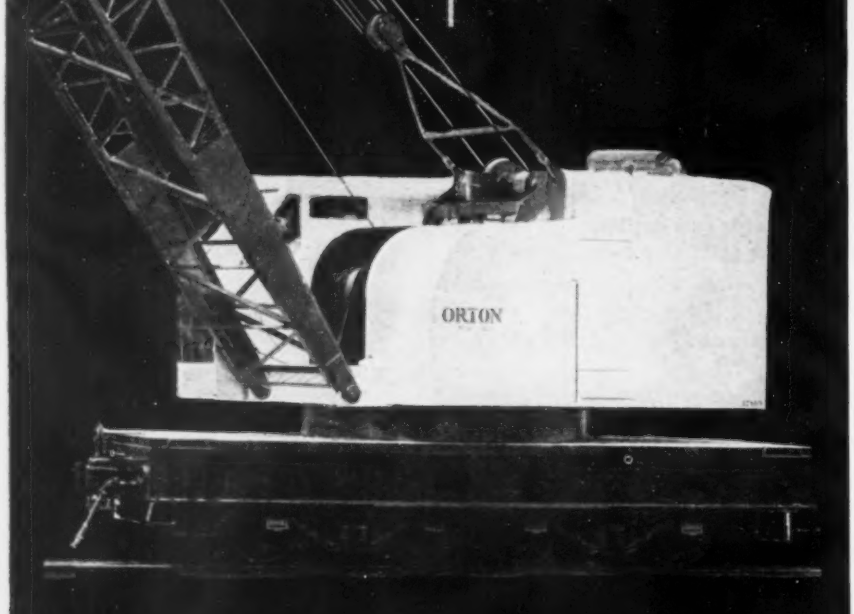


ORTON CRANE AND SHOVEL COMPANY
608 SOUTH DEARBORN STREET • CHICAGO 5, ILLINOIS

• PATENTED

—New Equipment—

Continued

End loading scoop

A fork-lift truck can be converted into a front-end loader in the 30 sec required to attach the scoop to the truck's auxiliary lifting mast. The scoop is used to pick up, transfer and dump loose materials like

sand, coke, turnings, cullet, castings, stampings, etc. There is no loss of material in transit to the dumping point, and dumping can be done at any desired height—from a few inches to the full fork lift of the truck. *Union Metal Mfg. Co.*

For more data circle No. 35 on postcard, p. 83.

Dry acid pickle

Quick-Pik is a dry, acidic salt mixture which when mixed in the proportions of 2 lb salts per gal of water will quickly remove scale and rust. The solution can be used at temperatures of 70° to 150°F. In its formulation are incorporated an inhibitor and a foaming agent which minimizes the attack of the acid on the base metal and produces a foam on the surface of the solution eliminating acid spray and reducing fumes. *Mitchell-Bradford Chemical Co.*

For more data circle No. 36 on postcard, p. 83.

Drill press guide

Drill press safety guide will eliminate C clamps and other types of fastening devices. Attaching directly to the column of the drill press, the safety guide is fully adjustable on the table and is firmly locked in position with one locking screw. It can be used to hold and position work without other fixtures, be used in conjunction with jigs or can be used to hold a standard drill press vise. *Walker-Turner Div.*

For more data circle No. 37 on postcard, p. 83.

Strippable coating

New fast drying, tough, strippable coating called CD Strip 100 is supplied as a solvent solution and is easily applied by dipping, brushing, or spraying. It is water insoluble and extremely strong even in thin gages. It protects aluminum and other metals during drawing and general fabrication and can be used for the general protection of glass, phenolic laminates, and similar surfaces. It is easily removed by stripping or peeling back the entire coating in one piece. Its bright red color quickly indicates section treated. *Chemical Development Corp.*

For more data circle No. 38 on postcard, p. 83.

Turret indexing units

Standard, intermittent-motion turret indexing units provide a basic packaged chassis for a wide variety of special automatic machines. They are offered with turret diameters of 20, 30 or 40 in., for mounting 16, 24, or 32 work sta-

tions. Indexing rates are from 547 to 4700 indexes per hr and dwell time may vary from 0.5 to 4.9 sec. Versatile in their application, these units eliminate much engineering and cost required in designing special machines for many light manufacturing operations on small and medium parts. *Swanson Tool & Machine Products, Inc.*

For more data circle No. 39 on postcard, p. 83.

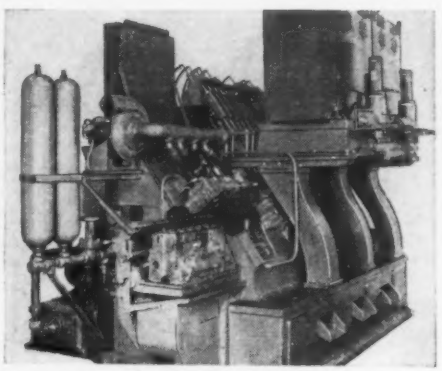
Turn Page

GREER TOPICS

Functions and Applications of the Greer Accumulator

Bunell's automatic cylinder trimming and forming machine incorporates two Greer accumulators to cut motorpump unit size by 50%. Slashed cost $600, weight 400 pounds and saved substantial floor space. Simpler circuit used few fittings for less maintenance.

How Greer Accumulators Reduce Power Requirements



Kreuger's huge Insert Valve Press uses 4 Greer accumulators to supply power needed to insert valves in auto cylinder blocks. The Greer accumulator reduced motor and pump requirements and assured the smooth, even flow of oil under pressure on circuit demand.

They store tremendous power in small space—deliver it instantly on demand of hydraulic system

As a primary source of hydraulic power where the work cycle does not depend on the flow of the pump or as auxiliary power in intermittent duty systems, the Greer accumulator has its most dramatic effects. In these applications, the Greer accumulator can save a great deal of power, reduce size and cost of equipment, and develop a much more efficient hydraulic circuit.

This compact and economical power package, with its unmatched ability to store power in small space, accumulates energy from the pump and delivers it instantly as required by the circuit, permitting small motors to do the work of big ones. For practical applications, read about the installation of Greer accumulators on the equipment as shown in photographs above and on left.

Greer's staff of expert hydraulic engineers are available for a discussion of your problem without obligation. Call or write Greer today.

Greer Hydro-Pneumatic Accumulators have many other diversified functions

(1) Pressure storage chamber for main, auxiliary and emergency power (2) Pressure-volume compensator for leakage and temperature (3) Dispenser of fluids and lubricants (4) Transfer-barrier for fluids and gases (5) Shock absorber for line shock and pump pulsation.

Precision engineered to make any hydraulic system better! Complete data and diagrams in Brochure 301. Write for your free copy.

U.S. PATENTS UNDER OLAER LICENSES

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3 • **ACCO Slings are Stocked by Your Industrial Supply House**—His stock is based on YOUR needs. So, your sling inventory can be held to a minimum since your distributor's stock is as close as your telephone.

4 • **These Slings and Fittings are "ACCO *Registered*"**—This assures you of highest quality and safety throughout.

Write today to our Wilkes-Barre office for name of the ACCO *Registered* Sling distributor nearest you.

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Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

ACCO Registered DUALOC Slings

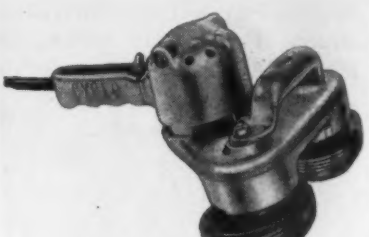
Pan-forming machine

New pan-forming machine, which is portable and hand-operated, will turn up the edges of a 50-ft roll of terne in 1 min flat. Conventional methods require 30 min. Mansaver as well, all the operator needs to do is to insert the continuous roll of metal at one end of the machine and thread it through a set of rollers. After that the speed with which pans are formed becomes a matter of how fast the operator wants to pull them through. *Follansbee Steel Corp.*

For more data circle No. 40 on postcard, p. 83.

Sander-polisher

New translatory action sander-polisher for sanding, filling, feathering and polishing metals, enamel, and other surfaces has two counter-balanced heads which eliminate



all centrifugal force and give hand finished results without swirl marks, scuffing or burning. Special cups are available for all types of grinding, smoothing and polishing of base metals and other raw surfaces. *Cyclo Mfg. Co.*

For more data circle No. 41 on postcard, p. 83.

Plating rack coating

By insulating and protecting racks, fixtures and anode hooks used in electroplating baths with Kote-Rax Grade L, a plastisol coating, maintenance cost is reduced. The Grade L coating is tough and ductile, will withstand rough treatment and abuse, and will wear longer both in and out of the plating bath. The coating assures minimum drag-out loss; retains its original color permanently. *Hanson-Van Winkle-Munning Co.*

For more data circle No. 42 on postcard, p. 83.

Bullet-proof aprons

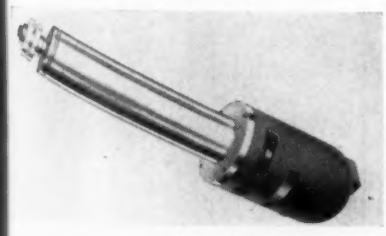
Made of glass-coated cloth, bullet-proof aprons are a factory-fashion development at Lockheed Aircraft Co. As light as a man's sport jacket, the form fitting aprons are so tough they can stop a .38-caliber bullet fired from 8 ft away. Employees at

Lockheed machine shops are wearing the aprons as protection against flying metal particles that may spurt from high-speed milling and cutting equipment. The shields are manufactured by *B. F. McDonald Co.*

For more data circle No. 43 on postcard, p. 83.

Precision spindles

Finishes up to 2½ to 4 microinches are said to be possible with new precision spindles. Improved method of spring preloading keeps the wheel chatter-free under radial



and axial loads. Spindle assembly is accurately balanced on its own precision ball bearings. Regardless of wear or temperature changes, self-adjusting feature permits much higher degree of finish, making it practical to eliminate lapping. *Whitnon Mfg. Co.*

For more data circle No. 44 on postcard, p. 83.

Turn Page

an ACCO product

ENDWELDUR SLING CHAINS

Small AMERICAN Sling Chain Lifts 25,000-lb Load Safely

• This ACCO *Registered* 4-leg, Endweldur 125 Sling Chain is relatively light in weight yet it has sufficient strength to lift an expensive 25,000-lb die with safety.

This desirable combination of great strength and light weight is the result of scientific heat-treatment of the alloy steel used in this modern chain and the proper combination of engineered hooks and pear shaped links that make up a complete ACCO *Registered* Sling Chain assembly. This gives you a chain that is easy to handle and safe to use even where working temperatures run up to 1000°F.

Endweldur 125 ACCALLOY Sling Chains come in sizes from ¼" to 1¼" with working load limits to 57,500 lbs per leg, so there is a size for just about every lift you have. Other AMERICAN Sling Chains are available in Endweldur 85 made of carbon steel, heat-treated . . . also stainless steel, monel metal and silicon bronze . . . and wrought iron.

AMERICAN has a sling chain for your every need. See your distributor or write our York, Pa. office today for the ACCO Registered Sling Chain Catalog.

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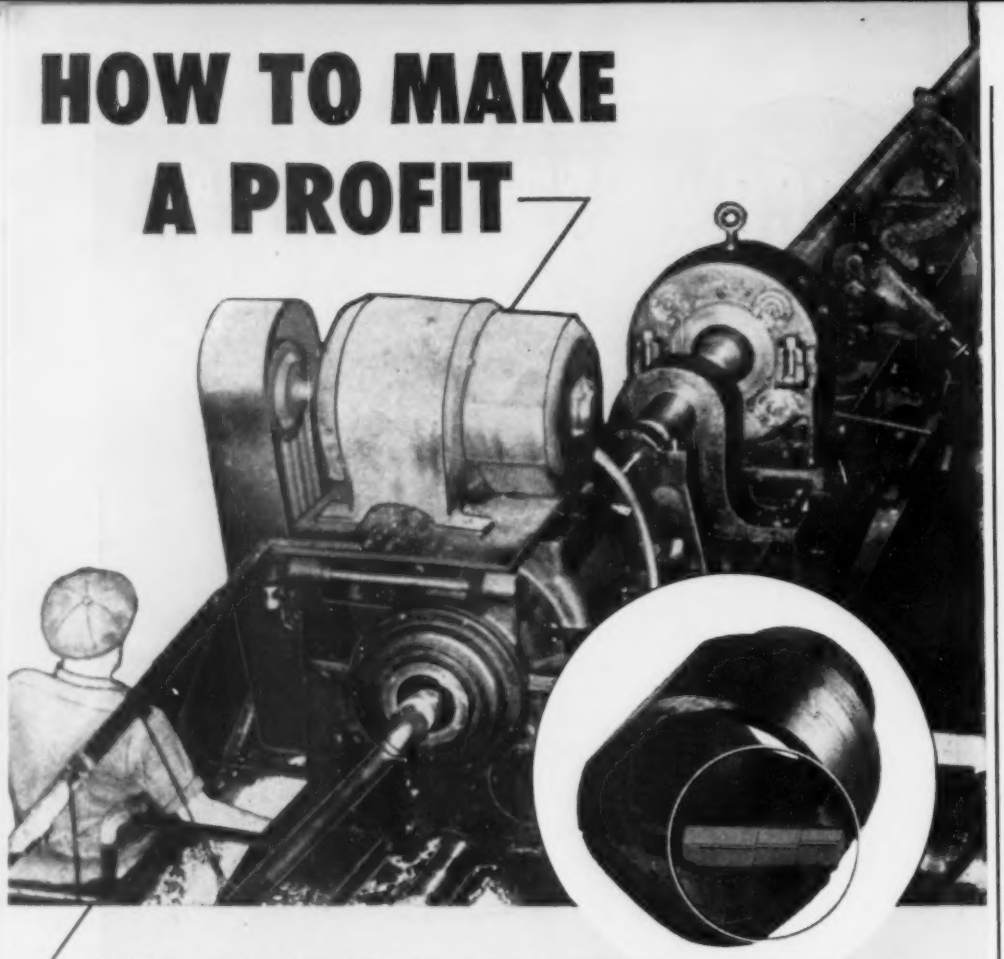
AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

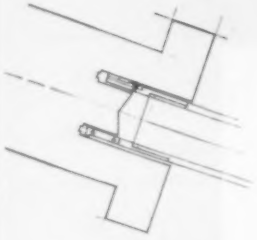
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

American Chain

HOW TO MAKE A PROFIT



BY GOING IN THE HOLE



Kennametal triple-edge tool trepans 4½" diameter hole through 30' workpiece at rate of 8 ft./hr. Three-inch core resulting from operation is usable for small diameter parts — a worthwhile saving in material.

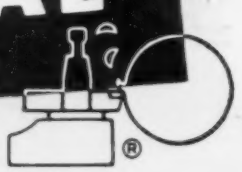
Drilling or trepanning deep holes with Kennametal has saved hours of time — added dollars to operating profit. Here are two examples:

To drill a 30 ft., 3" hole in chrome-nickel-moly steel with HSS spade drill required 12 hours. An off-center, triple-edge Kennametal drill head (shown above) did the job in 2 hours.

To trepan a 30 ft., 4½" diameter hole in forged steel with HSS spade drill consumed 20 hours. A triple-edge Kennametal tool (shown at left) reduced the time to 8 hours.

Complete details of these two operations furnished on request. They are typical of a wide range of metal-working jobs on which Kennametal tooling has proved to be a profitable investment.
Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY



—New Equipment—

Continued

Fire extinguisher

For extra protection against in- cipient Class B and C fires a new 1-qt trigger-operated fire extin- guisher has increased fire killing capacity. It is a stored pressure unit charged with bromochloro- methane, more commonly known as CB liquid, a faster-acting vaporiz- ing liquid fire extinguishing agent that has proved effective on flam- mable liquid and electrical type fires. This lightweight unit is de- signed for one-hand operation; can be aimed like a gun. *American LaFrance-Foamite Corp.*

For more data circle No. 45 on postcard, p.

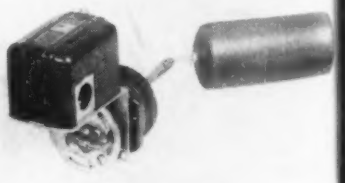
Plastic solder

An improved plastic metal base cold process solder is used for fill- ing imperfections in castings, pat- terns, machinery, and all other metal surfaces. Duro Solderwel No. 53 is a metallic plastic in putty form. Solder is applied cold, just as it comes out of the can, the only necessary tool is a spatula or putty knife. It dries to a metal hardness when exposed to the air; can be ground, filed, or sanded down to a level feather edge. *Woodhill Chem- ical Co.*

For more data circle No. 46 on postcard, p.

Tank float switch

Screw-in tank float switch for con- densate pumps provides automatic control of the liquid level within closed tanks. Float position can be changed from right to left hand



side or vice versa. Contacts may be converted to either open or close on liquid rise. A float position indi- cator and indicating dial aid in ob- taining proper settings of the float. Switch functions properly under 5 psi pressure. *Square D Co.*

For more data circle No. 47 on postcard, p.

The Iron Age

SALUTES

Thomas M. Cole

This "younger generation" executive suffers mainly from ability and a liking for hard work.

TOM Cole refuses to let his background handicap him. Being the boss's son just isn't good enough. He started running his father's business in 1941 at the age of 19, has been the sparkplug of a remarkable industrial success story ever since.

When Tom came down from Cornell to take over, Federal Electric Products Co. was one plant in Newark, N. J., employing 35 people. Today the company has 11 plants in operation, is building more, and is one of the top 6 U. S. manufacturers of electrical distribution equipment. Total employment is over 3000.

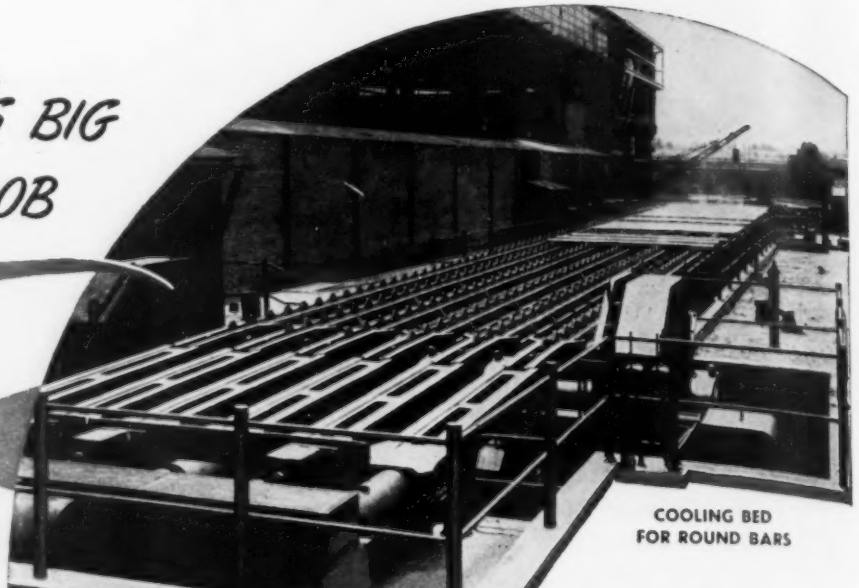
Tom's ability was formally recognized in 1946, when he was made president of the firm at the age of 24. Under his leadership, Federal Electric has acquired new facilities, broadened its line, and pioneered new products. Latest major move a few weeks ago was acquisition of Pacific Electric Manufacturing Corp. of San Francisco.

That rare bird, a born New Yorker, Tom has been absorbed with electrical manufacturing since he began his engineering studies at Cornell. On the technical side, he holds about 70 patents in his own name, spends considerable time in research and development work.

A hard worker, Tom is also a firm believer in a 9 to 5 day and a 5-day week. "Weekends," he stresses, "should be for the family." He spends his with his wife and three children at Harrison, N. Y., takes time for his hobby of scale model railroading. Electrical? Of course.

F&M makes "what it takes"

FOR INDUSTRY'S BIG PRODUCTION JOB

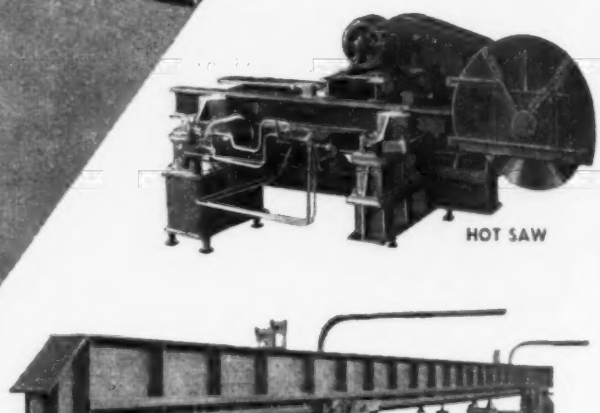


COOLING BED FOR ROUND BARS

F&M Products

- PARALLOY ROLLS (PINCH, COILER, TENSION, STEEL MILL)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—TRAVELING AND LIFTING TABLES
- CONTINUOUS PICKLING LINES—ROLLER LEVELLERS
- FURNACE CHARGING EQUIPMENT—FURNACE PUSHERS
- STRIP STEEL COILERS AND REELS—SCRAP BALLERS
- RAILROAD SPIKE FORMING MACHINES—ROLL LATHES
- SHEET GALVANIZING LINES—WIRE PATENTING FRAMES
- STRETCHER LEVELLERS—ANGLE AND SHAPE STRAIGHTENERS
- ROLLING MILL TABLES—GEAR AND INDIVIDUAL MOTOR TYPES
- DUCTILE CASTINGS (80,000 PSI)
- MACHINERY BUILT TO CUSTOMER'S DESIGN AND DETAIL DRAWINGS

HOT SAW



SHEAR GAUGE STRUCTURAL MILL SHEAR TABLE

42" ROLL LATHE

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

The Iron Age

INTRODUCES

J. S. Thompson, A. A. Browne, and T. Challoner, named to the board of directors, FEDERAL ELECTRIC PRODUCTS CO., Newark.

C. W. Sherman, appointed honorary chairman, DOMINION FOUNDRIES & STEEL, LTD., Hamilton, Ontario, Canada; **F. A. Sherman,** named chairman; **A. G. Wright,** made president; F. A. Loosley, becomes vice-president; and **F. H. Sherman** elected executive vice-president.

John V. Boardman, appointed vice-president, Mifflin Junction plant, PITTSBURGH FERROUS PRODUCTS CO.

Stephen H. Badgett, appointed vice-president-manufacturing, SCHAIBLE CO., Cincinnati.

Philip B. Turley, elected to vice-president, THE TUBE CITY IRON & METAL CO., Glassport, Pa.

L. H. Oppenheim, named vice-president, HENRY J. KAISER CO., Oakland, Calif.

Nils H. Lagerstrom, appointed vice-president, DAMASCUS TUBE CO., Greenville, Pa.

Edward E. Hill, named assistant chief inspector, WORCESTER PRESSED STEEL CO., Worcester, Mass.

Charles Modersohn, named chief engineer, Industrial Div., WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis.

B. Otto Wheeley, promoted to southern district sales manager, Tar Products Div., KOPPERS CO., INC.

William C. Swinghamer, appointed manager of District Application & Training Dept., WESTINGHOUSE ELECTRIC CORP., San Francisco; and **William L. Borden,** joins planning committee at Pittsburgh.

John L. Stewart, appointed Chicago district sales manager, UNIVERSAL-CYCLOPS STEEL CORP., Bridgeville, Pa.; and **Otto F. Carl,** named special representative.

Gordon R. Bryant, made Detroit district manager, AMERICAN WHEELABRATOR & EQUIPMENT CORP.; **Robert L. Orth,** named field sales manager, Mishawaka; and **John W. Swantz,** becomes district sales engineer at Detroit.

G. D. Welty, named to newly-created position of manager of aircraft sales, ALUMINUM CO. OF AMERICA, Pittsburgh; and **John H. Weisgerber,** becomes public relations manager, Cleveland works.

T. Jack Henry, appointed advertising manager, LINCOLN-MERCURY DIV., Ford Motor Co., Detroit.

Stephen Rasul, appointed manager of design and production engineering, Riverdale, Ill., ACME STEEL CO.

E. H. Schoonmaker, appointed district manager, St. Louis district sales office, Eddystone Div., BALDWIN-LIMA-HAMILTON CORP.

Canute R. Olsen, named manager of general sales staff, United States Supply Div., U. S. STEEL CORP.; and **Gladstone C. Hill,** appointed manager of sales, Indianapolis area.

Jack W. Gleeson, named director of business management, Chrysler Div., CHRYSLER CORP., Detroit.

Carl H. Hageman, becomes assistant manager, Industrial Relations Dept., UNION CARBIDE & CARBON CORP., New York.

Andrew J. Dunkle, appointed director of works standards, AC Spark Plug Div., GENERAL MOTORS CORP.; and **Henry G. Milans,** named truck retail sales manager in charge of factory branch at Chicago.

C. I. BRADFORD, appointed vice-president and director of operations, Rem-Cru Titanium, Inc., Midland, Pa.

WILLIAM W. EGE, named vice-president in charge, Wire & Cable Div., Copperweld Steel Co., Glassport, Pa.

JOHN A. MARSH, elected vice-president, The International Nickel Co., Inc., New York.

Personnel

William F. Oswalt, named general manager, newly-established General Purpose Control Dept., Schenectady, N. Y., GENERAL ELECTRIC CO.

E. G. Counselman, named sales engineer, Machinery Div., New York territory, DRAVO CORP.

Ralph Edwards, appointed general sales manager, machine tools, HANSON-WHITNEY CO., Hartford, Conn.; and **Edward P. Cody,** named general sales manager, small tools and gages.

Bruce Atwater, appointed sales manager, INET, INC., Los Angeles.

Harry Murray, becomes sales engineer at Erie, Pa., RITE-WAY TOOL CO.

William A. Oakford, named branch manager, DRAKE STEEL SUPPLY CO., San Diego area; **Arl J. McCormick,** becomes assistant sales manager, Field Sales Div., Los Angeles; and **Bill F. Mowbray,** promoted to credit manager in Los Angeles.

George R. Lundberg, promoted to sales manager, Brush Div., OSBORN MFG. CO., Cleveland; **Frederic T. Turner,** named manager, market research; and **Everett A. Sisson,** promoted to assistant sales manager.

George F. Thompson, appointed western zone manager, K. O. LEE CO., Aberdeen, S. D.

Angus J. Walker, appointed director of purchases, Holtzer-Cabot Div., NATIONAL PNEUMATIC CO., INC.

Bert J. Aamodt, named assistant manager, CAPITOL FOUNDRY CO., Phoenix, Ariz.

James L. MacDowell, made manager of tooling and quality, STANDARD PRESSED STEEL CO., Jenkintown, Pa.; and **James B. Snyder,** named chief accountant.

E. B. Meynard, advanced to new position as general sales manager, BUCKEYE TOOLS CORP, Dayton; and **R. V. Shaffer,** appointed field sales manager.

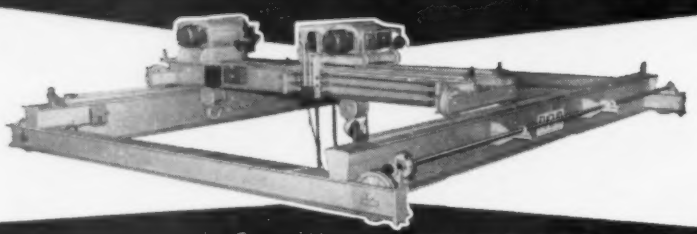
VICTOR P. GEFFINE, elected president, Cliffs Power & Light Co., Ishpeming, Mich.

JACK LEWIS, elected to vice-president in charge of all production, Hyster Co., Portland, Ore.

THOMAS W. GABRIEL, appointed assistant vice-president in charge of sales, Jessop Steel Co., Washington, Pa.

ROBERT L. CLARK, appointed director of purchases, Kropp Forge Ordnance Co., Melvindale, Mich., a subsidiary of Kropp Forge Co.

EUCLID SPECIAL CRANE



a composite of proven STANDARD UNITS

As a rule a "special" Euclid Crane embodies *standard* hoisting, traveling and control units combined with scientifically engineered bridge, trolley, etc.

The purchaser obtains a crane with a full factor of five, thoroughly tested and proven components, the economy of volume production and the assurance of satisfactory performance due to years of specialized experience.

The above crane has a rigidly mounted hoist and hook; also a hoist and trolley which travels lengthwise of a secondary bridge. This permits convenient and efficient handling of bundled material of various lengths.

Write us for a recommendation mentioning conventional or special requirements.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

1361 CHARDON ROAD • EUCLID, OHIO

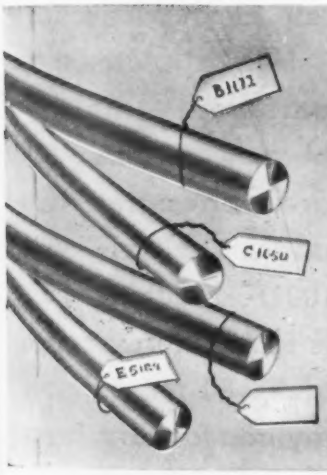
La Salle MANUFACTURES QUALITY COLD FINISHED STEEL BARS . . .

ROUNDS, FLATS, SQUARES, HEXAGONS, SPECIAL SHAPES

LaSalle produces a complete range of popular sizes, shapes, and lengths to fit your needs for economical production. Special shapes are produced to order.

COLD-DRAWN, GROUND AND POLISHED, TURNED AND POLISHED

Modern equipment and skilled workmanship insure uniformity, strength, finish, and close tolerances.



CARBON AND ALLOY STEELS

It will pay to make LaSalle your first choice for cold finished bars in AISI and SAE steels in both carbon and alloy grades.

FURNACE TREATED STEELS

A complete battery of furnaces plus special drawing equipment make possible a wide range of fabricating methods and varied physical properties.

STRESSPROOF **LA-LED** **SPECIAL STEELS**

These include STRESSPROOF, with in-the-bar strength, wearability, machinability, and minimum warpage; and free machining LA-LED for better parts at lower costs.

AMERICA'S MOST COMPLETE LINE!

Send for Booklet "The Story of Cold-Finished Steel Bars"

La Salle STEEL COMPANY 1412 150th St., Hammond, Indiana

. . or Released in an Instant

Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.

Bolt threads are gripped tightly . . . these famous nuts *never* work loose. Yet an ordinary hand wrench gives instant release. The tough, built-in GREERCOID collar does it . . . and seals against fluid leakage, too!

Study *your* fastener problem. Over 3000 types and sizes. Consult GREER. Proved on thousands of products. Meets gov't and military specifications.

Write
GREER STOP NUT CO.
2620 Flournoy, Chicago 12, Ill.

GREER Stop Nuts

—Personnel—

Continued

J. D. Grace, named sales manager, Screen Dept., Crusher Div., NORDBERG MFG. CO., Milwaukee.

Philip I. Wolf, made sales engineer, Research & Control Instruments Div., NORTH AMERICAN PHILIPS CO., INC., Mount Vernon, N. Y.

William F. Jenkins, appointed sales manager, Butterfield Div., UNION TWIST DRILL CO., Derby Line, Vt.

John F. Apsey, Jr., appointed marketing manager, THE BLACK & DECKER MFG. CO., Towson, Md.

E. J. Byrnes, Jr., appointed assistant general manager of sales, Eastern Div., THE COLORADO FUEL & IRON CORP., New York.

B. E. Elson, appointed factory manager, MILLS INDUSTRIES, INC., Chicago; and **George K. Ergang**, named manager of industrial relations.

Dr. L. J. Brady, appointed director of research, FERROXCUBE CORP. OF AMERICA, Saugerties, N. Y.

Sam S. Dewson, named representative for electrical relays, Chicago, Sterling Engineering Co., a subsidiary of AMERICAN MACHINE & FOUNDRY CO.; and **J. O. Schmitz**, made representative in Kansas City, Kan.

Hugh V. McGuire, named sales representative, JACK STEELE CO., Philadelphia.

Rudolph Winters, appointed superintendent, Hamilton, Ohio, plant, CLEARING MACHINE CORP.

Arthur A. Gustafson, appointed district sales representative, AMERICAN SILVER CO., Flushing, N. Y.

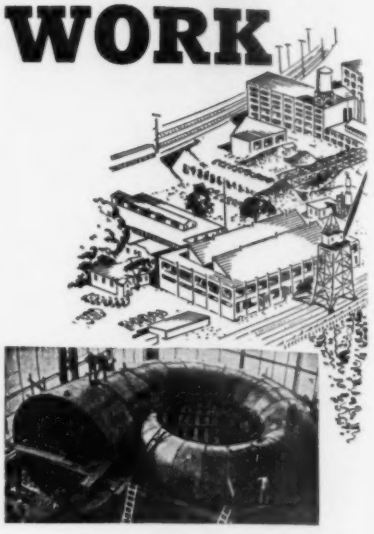
OBITUARIES

Victor W. Peterson, 61, chairman of the board, Hannifin Corp., suddenly at his Indiana farm.

Matthew J. Scammell, president, S. L. Allen & Co., Inc., at his home in Trenton, N. J., recently.

Oscar Sinigaglia, president, Societa Finanziaria Siderurgica Finsider Per Azion, Rome, Italy, of a heart attack.

STEEL PLATE WORK



TURBINE CASINGS and other heavy steel plate work are fabricated at Pusey-jones of Hot-Rolled, High-Strength, Low-Alloy Steel.

Every facility for large scale metal fabricating: — Heavy plate shop equipment — Rolls — Shears — Bending furnaces. Stress relieving furnace 33'x18'x16' up to 2100°F. Machine shop for facing, turning, and boring. 50 ton capacity gray iron foundry. Deep-water transportation on one side, the Pennsylvania RR on the other. Talk to our development engineers.

Metals Fabrication Division
THE PUSEY AND JONES CORP.
504 Front Street, Wilmington, Del.
Established 1849

PUSEYJONES

What it takes to make a 3000 Degree Refractory Concrete

Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

Q. *When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?*

A. No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.

Q. *Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?*

A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

Q. *Then you have a grog, a binder and a method of putting them together. Which is most important?*

A. You can't say that any *one* is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.

Q. *And now, what about the binder?*

A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the prefiring of the binder to produce stable compounds.

Q. *Just how important is the manufacturing or "blending" of the grog and the binder?*

A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, prefiring temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

Q. *These factors you've discussed must add up to some specific advantages of Kaocast. What are they?*

A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.

the most powerful industrial magazine in the world

The Iron Age
FOUNDED 1855
Technical Articles

Tough nut to crack—

HERE'S HELP IN FABRICATING BRITTLE TITANIUM

By E. F. Hutchinson
Metallurgical Engineer
Thomson Laboratories
General Electric Co.
Everett, Mass.

◆ **Brittleness in titanium and its alloys stands as a major obstacle to wider titanium application . . . Proper use of heat is a big help in overcoming the metal's poor cold forming qualities . . . Drop forge blanks can be press sheared without shattering by using an induction coil to heat barstock.**

◆ **Caustic descaling causes loss of bend ductility . . . Properties and grain structure of contour forging are improved by forging from the billet at 1900°F, modifying finish dies and eliminating a blocking operation.**

◆ **Successful welding requires complete removal of annealing scale, use of inert gas to prevent oxygen and nitrogen contamination . . . Snagging should be done hot and followed by a stress relief anneal to prevent cracking. Low wheel speeds and feeds help offset heat buildup in grinding.**

◆ UNEXPECTED AND VARIED brittleness in "ductile" titanium and its alloys is a big stumbling block in the path to successful application of the metal. Signs of embrittling effects crop up in both forging and welding processes. Brittle behavior has also occurred in parts having ground or machined surfaces, although the tensile and impact properties of the base material were satisfactory.

Unfortunately, the most frequent and damaging cases of low ductility and/or inadequate toughness have been found in fabrication of the higher strength titanium alloys. It is with these materials that the major advantage in strength-weight ratio exists over aluminum alloys and stainless steels in the operational range of 300° to 800°F.

Drop Forging

To do a satisfactory forging job on titanium alloy small drop forgings consistently, hardness of the fully annealed barstock must not exceed Rc 36. Lower ductility and higher hardness found in some annealed bar generally result from excessive oxygen. For Ti 150A, hardness is linked to oxygen content. While no similar correlation has been established for RC-130-B, it is believed one exists. The higher hardness barstock lowers the hammer bend angle of both barstock and finish forgings.

Preparation of blanks for swaging, the swaging operation itself and the hand straightening of finished forgings all demonstrate the poor room temperature formability of these alloys.

Barstock sections cut off with an automatic shear press shattered until an induction heating coil was mounted ahead of the shear blades. Swaging machines either failed to reduce or shattered alloy sections at room temperature. Adequate swaging is now done at between 500° and 1000°F. Finished forgings having a bow longitudinally are heated to 1300°F to prevent cracking during hand straightening.

Early tests indicated titanium forgings could

Contour forgings were made in one heat to cut time at temperature, raise percentage reduction.

not stand overheating. Those blocked at 1950°F suffered a severe attack which roughened and pitted the metal underneath the scale. Even short times at temperatures over 1700°F caused excessive scaling and absorption of oxygen and nitrogen to measurable depths. Although the scale might be completely removed by mechanical or chemical cleaning, the effect of the absorbed gases alone was enough to destroy the forging's bend ductility.

To retain maximum ductility, Ti 150A drop forgings must be held only the minimum times necessary for forging at 1575° to 1650°F. Holding in the forging range will permit both gas absorption and scale buildup with the same deleterious effect on bend ductility that would result from higher temperatures and shorter times.

Use of the standard gas curtain at the furnace door may also have contributed to the brittleness of early experimental forgings. Since the burning gases are largely hydrocarbons, the opportunity for hydrogen pickup and diffusion was prevalent. The small hydrogen atoms diffuse many times faster than oxygen of nitrogen atoms. Thin edges can be completely embrittled in relatively short times of exposure to hydrogen containing atmospheres. Current practice uses no gas curtain or furnace atmosphere.

With development of optimum forging times, temperatures and atmospheres, the need arose for the easiest method of scale removal. Hydrofluoric, the only acid which will attack titanium with sufficient rapidity, would not attack the oxide rapidly or uniformly. Molten caustic soda at 725°F removes the scale in 30 to 60 min, leaving a bright surface, and attacks and reveals any defects such as seams or folds. However, forgings cleaned in caustic were found to be extremely brittle when they were tested.

One of these brittle pieces was heated in a high vacuum to 900° to 1200°C. The inside of the bell jar was coated with titanium and large amounts of hydrogen were given off, indicating the breakdown of titanium hydride. Retesting the vacuum heated forging showed bend ductility had been completely restored. Apparently, titanium's affinity for hydrogen is so great that it can extract hydrogen from the molten sodium hydroxide. Although titanium producers use molten caustic base descaling baths such as Virgo salts and sodium hydride for short immersion times, forging scale is now removed from small forgings by sandblasting.

Heavy Contour Die Forging

Based on forging temperatures for small drop forgings, it was felt the temperature for contour wheel forging should be dropped from 1800° to 1600°F. However, pancakes forged at 1600°F would not move fast enough to fill the contour dies even in several heats. Pieces forged at 1900°F from specially prepared pancake forgings having 15 pct elongation were tested and found to be low in both ductility and toughness with a very large equiaxed grain structure. Apparently the percentage reduction effected by contour forging was insufficient to counteract the strong tendency for rapid grain growth at 1900°F, Fig. 1.

To fill the dies it was necessary to reheat once or twice during blocking and during finishing. Since grain growth and gas absorption are functions of time at temperature as well as the temperature level, short heating time was essential. To reduce time at temperature and increase percentage reduction, contour forgings were made in one heat. This was accomplished by modifying the finish dies, eliminating the blocking operation, and by forging from the billet at 1900°F. Properties and the grain structure both showed considerable improvement, Fig. 2. The 1900°F temperature could be tolerated for one heat since the percentage reduction was large.

EFFECT OF ALLOY CONTENT ON WELD DUCTILITY

Grade	Parent Metal Sheet Titanium			
	Alloy Content	Tensile Strength, psi	Elongation, pct	Bend Angle Over 1½ T Radius, Deg.
RC-55	0.1 O_2, 0.03 N	86,500	30.0	180
RC-70	0.3 to 0.4 O_2, 0.5 N	93,400	24.5	180
RC-130-A	0.3 to 0.4 O_2, 0.05 N, 7.0 Mn	148,900	17.0	95

Since occasionally parts forged from pancakes with resultant large grains showed reasonably good elongations of 12 to 13 pct, it was felt composition might have a decided effect on the resultant ductility. A forging, in which the grain size was coarsened by 1800°F treatment, might retain much of its prior ductility if the oxygen content was not in excess of that needed for strength.

Carbon contents of over 0.25 pct appear to have severe embrittling effects on forged and rolled titanium materials. Even smaller amounts of carbon will progressively reduce the impact strengths of titanium and its alloys.

Welding

Molten titanium's affinity for all active gases makes it imperative that arcwelding be conducted in an inert atmosphere of argon or helium. Even a slight contamination of oxygen or nitrogen, such as might be obtained from a low purity argon protective atmosphere, may severely embrittle the weld. Contamination of the surfaces to be welded can reduce the ductility of a titanium weld or prevent formation of a true weld. Even spotwelding—readily accomplished on all grades of titanium—will not be successful if all annealing scale is not first removed.

Macro and microstudies of the fusion and heat affected zones of titanium welds reveal the mammoth size of the grains. While very large grains in themselves may not drastically reduce bend ductility, there is a good chance that segregation of interstitial elements may take place at the grain boundaries with resultant embrittlement, Fig. 3. The precipitated or secondary alpha phase tends to be oriented with respect to the grain boundaries. Such preferred orientation might be somewhat responsible for weld ductility being lower than parent metal ductility.

Production of these enormous grains in welded joints results from the extremely rapid rate of grain growth. Grain size of sheet titanium samples heated for only a few minutes at 1700°F exceeds ASTM No. 1. The rate of growth increases rapidly with temperature. Thus, the rate of cooling from a molten weld nugget would have to be extremely rapid through the high temperature range to inhibit excessive growth.

Even if it were possible to quench so rapidly that the molten metal would solidify and cool below 1600°F before the new grains could grow appreciably, the mammoth grains, which were produced on heating and which never became molten (heat affected zone), could not be refined by quenching. In practice a larger percentage of weld bend failures have occurred in the heat affected zone than in the fusion zone.

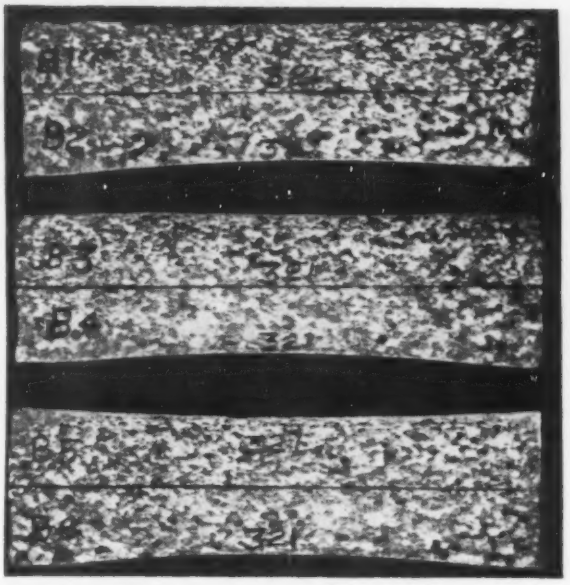


FIG. 1—Large grains show in macro-etched tangential test bars forged at 1900°F. Low (15 pct) percentage reduction did not counteract rapid grain growth. IX

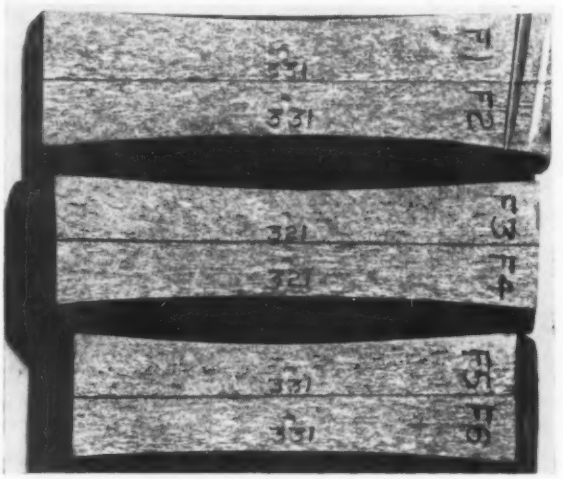


FIG. 2—Grain structure was refined and, properties improved by shortening time at 1900°F and attaining greater percentage reduction in forging. IX

One of titanium's basic physical characteristics may contribute in part to its very rapid rate of grain growth. Titanium has an exceptionally low thermal conductivity; approximately 4 pct of the conductivity of copper, 12 pct that of 75 S-T6 aluminum alloy, and less than 93 pct that of 302 austenitic stainless steels. Since the localized heat of welding cannot be as rapidly dispersed in titanium, the local area will be at the temperatures where rapid grain growth occurs for longer periods.

One condition for rapid grain growth on heating must be the formation of a homogeneous beta phase in which has taken place a complete solution of the interstitials which might otherwise block the growth to large grains. During solidification from a molten weld nugget, there must be relatively few nucleation points presented or numerous smaller grains

Titanium work hardens readily . . . With increasing cold work, formability decreases . . . As critical deformation percentages are reached, an intermediate anneal is needed to remove cold work stresses . . .

would form with insufficient time to grow during quenching by the mechanism of absorbing each other.

Even more surely than in the case of forgings, composition can be a serious factor in weld ductility. Two heats of RC-70 were welded and tested, one arcmelted heat with less than 0.1 pct carbon and one induction melted heat with more than 0.3 pct carbon. The bend ductility of the higher carbon heat was much lower. Indications also exist that excessive contents of other interstitial elements such as oxygen, nitrogen and hydrogen will lower weld ductilities. When metallic alloy additions are made to titanium, inert arcwelded samples of these alloys are, without exception, found to be extremely brittle both in tension, Fig. 4, and in bending.

Contributing to this embrittlement may be the effect of the combination of metals on the phase transformation temperatures and the percentage of retained beta phase at room temperature, since the interstitials are more soluble in alpha than in beta. Also, the alloying metals may tend to segregate with harmful effects as the fusion zone begins to solidify.

Part of the decrease in titanium welded joint ductility as alloy content increases is inherent in the parent metal. On three titanium grades, see Table, increasing alloy content raises the strength level but lowers the tensile elongation and the bend ductility.

The elongations reveal RC-55 to be more ductile than RC-70, even though RC-70 has sufficient ductility to bend the limit of 180°. Since high strength alloy parent metal has only slightly more than 50 pct of the ductility of commercially pure titanium, even equivalent reductions in ductility as a result of grain growth, orientation, precipitation, etc., in the welds could render the high strength alloy weld brittle while retaining a satisfactory amount of ductility in the commercially pure titanium weld.

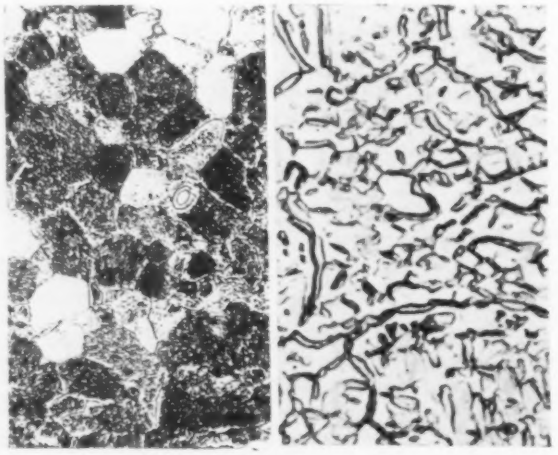


FIG. 3—Microstructure at edge of inert arcweld in RC-130A 7 pct Mn titanium alloy sheet. At left (100X) note incipient grain growth in outer edge of heat affected zone. At right, (1000X) same area shows tendency for alignment of constituents continuously at large grain boundaries. Etch used was HF-HNO_3.

Forming

Relative formability of the titanium grades is also a function of composition as it in turn affects strength level. Commercially pure low-strength sheet such as RC-55 and Ti 55A can be deep drawn to duplicate most low-carbon mild steel parts, but more intermediate anneals are needed.

The additional anneals may be necessary because of titanium's lower ductility, higher strength or different work hardening characteristics. However, the oxygen-nitrogen low alloy and the metallic alloy grades generally require heating to between 500° and 1000°F for any but minor deformations,

With the addition of strengthening elements, the ability of titanium to be deformed cold decreases sharply, even though the material retains 15 to 25 pct tensile elongation. Low alloy barstock, RC 20 to 28, could be sheared and swaged cold, while both the ferrochrome alloy Ti 150A and the manganese-aluminum alloy RC-130-B having hardnesses of RC 30 to 36 had to be heated before shearing.

Like many other metals, titanium work hardens readily. With increasing percentages of cold work, formability decreases. As critical amounts of deformation are approached, such as 50 to 60 pct reduction in thickness in commercially pure sheet, an intermediate anneal is needed to remove cold work stresses and regain original ductility.

Concentrations of oxygen, nitrogen or carbon (scale) at the surface of titanium strips heated in air or other active atmosphere will markedly decrease their angle or bend before cracking.

Other surface conditions can have important effects upon forming. Sandblasting strips from as-received commercially pure titanium has been found to reduce the angle of bend over a 1½T radius from 180° to less than 100°. Treatment of these sandblasted strips in 10 pct hydrofluoric acid for approximately 5 min

removed several thousandths of affected surface and restored the 180° bend.

Since metallographic study of the cross-section after sandblasting failed to reveal any cold work or other structural change from surface to center, it appears that titanium is sensitive to small, sharp surface notches or pits when under bending stresses. Transverse No. 2 file scratches imposed on longitudinal commercially pure titanium bend specimens reduced the 1½T bend angle to 107°. Thus the pits and scratches produced on blasted and machined surfaces can seriously reduce the formability of titanium sheet.

A major part of the poor cold formability of grades having 90,000 psi tensile strength or more is believed to be directly related to the room temperature crystallographic form of titanium. Similarly poor cold forming properties are exhibited by other hexagonal close packed metals such as magnesium and zinc. With these metals as with titanium, heating only a few hundred degrees greatly improves their formability.

Grinding and Snagging

Most grinding techniques successfully used on steel cannot be used on titanium without overstraining and cracking. The latter results are brought about primarily by the local overheating. Titanium's low conductivity permits a severe buildup of heat before such heat is dissipated. Low wheel speeds, low unit downfeeds, and better lubrication alleviate this condition greatly for finish grinding.

Heavy snagging operations must either be done hot as is frequently necessary between forging heats or the snagging must be followed by a stress relief anneal to prevent cracking.

Coarse or sharp machining marks may effectively create a notched condition capable of decreasing fatigue strength and bend ductility. Pits resulting from sandblast may act as stress-raisers.

Design Needs

Although indications of titanium's tendency to be notch sensitive have frequently been reported, an intensive investigation of design limitation is sorely needed. Critical surface finishes and minimum fillet radii should be established for various stress conditions.

A program is now underway in the Thomson Laboratory to determine the minimum radius of notch necessary to prevent drastic reductions in the fatigue strengths of two commercial high strength alloys. Notched tensile bars and notched stress rupture bars failed to show expected sensitivity under short time, low strain rate tensile stress or under the long time static loaded rupture stress.

Failure after 24 hr of a force-fitted part has led to the establishment of a "time-fracture test." Oversized steel pins are forced into a square cut groove in a rectangular block of the alloy to be evaluated, Fig 5. With one alloy, cracks or sudden fracture occurred in times ranging from a few minutes to more than 3 days after assembly. As spread was increased by forcing in larger pins, time required for fracture decreased. This phenomenon is being investigated more fully to determine the effect of varying compositions, tensile strength, ductility and impact strength on the time required to produce failure.

Tensile testing of a high strength titanium alloy was recently conducted at 0°F. From a room temperature level of 21.5 pct elongation and 57.6 pct reduction of area, ductility dropped to 6 pct elongation and 9.9 pct reduction of area. If both major bar and forging alloys show such a drastic reduction in ductility at temperatures of 0°F and below, it may well necessitate extensive redesigning to accommodate for the ductility loss.

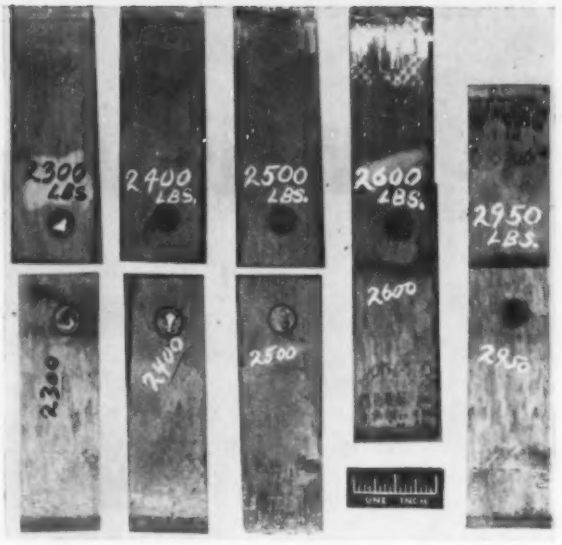


FIG. 4—Ultimate loads and brittle types of failures shown in these fractured tensile shear tests of spotwelded 0.060 in. RC-130A titanium alloy sheet.

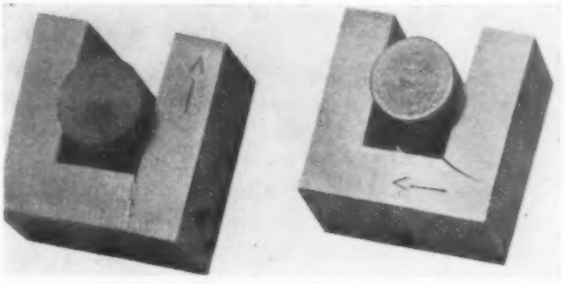


FIG. 5—Oversized steel pins are forced into square cut groove in rectangular block of alloy to be tested in a new "time-fracture" test. Arrows show direction of rolling. As spread increased by forcing in larger pins, time for fracture decreased.

Buyers and sellers—

What About Weight Variations

By M. A. Passer, Manager, Statistical Dept. and I. M. Bettman, Financial Vice-President
David J. Joseph Co.
Cincinnati

◆ Two out of every three cars of iron and steel scrap are short 700 lb net when shippers use railroad car weights . . . The 500 lb tolerance took care of only a third of the cars covered in this study.

◆ Major cause of shortage is unreliability of the marked tare weight . . . Shippers who use actual light weight rather than the usual tare cannot entirely escape the variations . . . Mill weights have been proven most reliable.

◆ SCRAP AND METAL producing industries have been aware of the problem of weight variations since the first carload of scrap was loaded and shipped to a user. By now everyone concerned accepts the fact that there will be weight variations on carload shipments of scrap.

The problem arises because of the sellers' habit of invoicing a shipment of scrap on the basis of weights furnished by a railroad, while final settlement is generally made by consumers of scrap on the basis of their own scale weights. Certainly some variation between the two weighings is expected. But in the long run these variations should offset each other to a great extent and produce a negligible net variation. This has not been the history in the shipment of scrap iron and steel. It seemed that a greater percentage of the cars shipped to consumers were having shortages (mill net weight less than shipper net weight) than overages; and the shortages seemed to be of greater magnitude than the overages.

Even though the weight variation problem is so widely recognized, there does not appear to be available any reliable information concerning the nature and extent of the variations to be expected. No statistical studies or analyses made of the factors which go into the making of a weight variation are available either.

So the writers set out to collect statistics on differences between the shipping and receiving weights on carload shipments of scrap to determine average weight variations, and analyze the more important factors which compose the variations. It is believed that the study which lies behind this paper was comprehensive enough to be significant—and scientific enough to be reliable.

In Carloads of Scrap?

For this study figures were collected on 2135 carloads of scrap shipped through the David J. Joseph Co. as broker over a period of 60 working days to three separate consuming steel mills. The shipments were of various grades of scrap iron and steel, and from many and scattered shippers located east of the Rocky Mountains. Included in the study were all cars moving to these three mills during the period covered for which could be secured: (1) Shipper weights, as furnished by the railroads; and (2) mill weights as provided by the consumers' own scales. In accordance with usual practice, the weights furnished by the railroads made use of the stenciled tare on the car, while the mill weights were based on actual light weighing of the cars.

For these 2135 cars, it was found that the average mill net weight was 678 lb less than the average shipper net weight. This average shortage is equal to 0.8 pct of the average net weight.

The average gross weight reported by the mills was 309 lb more than the average shipper gross weight, but this was more than offset by the fact that the mills showed an average tare weight 987 lb heavier than the average shipper or stenciled tare, resulting in the average shortage of 678 lb given above. The average variation of 309 lb in the gross weight amounts to 0.2 pct of the average gross weight of the cars; and the average variation in the tare amounts to 2.0 pct of the average stenciled tare. Distribution based on variations of net weight of the 2135 cars are shown in the chart below.

Assuming that this sample of cars is representative of the industry as a whole, of every 100 cars shipped to a consuming point, 68 will show a shortage, 31 will show an average, and one will be taken in with no variation. Not only will two-thirds of the cars have a mill net weight less than the shipper net weight, but in addition, the average shortage

DISTRIBUTION OF 2,135 CARS

By variations in their...

lb	NET WEIGHTS Cars	GROSS WEIGHTS Cars	TARE WEIGHTS Cars
OVERAGE More than 5,000	11	13	38
3,001 to 5,000	17	25	91
1,001 to 3,000	159	205	666
501 to 1,000	150	464	512
1 to 500	313	759	450
NO VARIATION	30	190	107
SHORTAGE 1 to 500	422	334	152
501 to 1,000	412	76	67
1,001 to 3,000	502	45	48
3,001 to 5,000	81	10	4
More than 5,000	38	14	none
	Total: 2,135 cars	Total: 2,135 cars	Total: 2,135 cars
OVERALL AVERAGE	(Shortage) 678 lb	(Overage) 309 lb	(Overage) 987 lb
Total cars showing an average	in the net: 650 or 30.4%	in the gross: 1,466 or 68.7%	in the tare: 1,757 or 82.3%
Total cars showing a shortage	1,455 or 68.2%	479 or 22.4%	271 or 12.7%
Total cars without a variation	30 or 1.4%	190 or 8.9%	107 or 5.0%
	2,135 or 100.0%	2,135 or 100.0%	(An overage in the tare reflects as a shortage in the net weight.) 2,135 or 100.0%

Only 5 pct of cars shipped will show no variation in tare weight when received at the mill . . .

on these cars will be greater than the average overage on the remaining one-third.

By custom, most consumers disregard variations of 500 lb or less. This weight tolerance was officially recognized by the Office of Price Stabilization in its scrap schedule, CPR 5. Reference to the chart will show that 765 cars or 36 pct of 2135 cars included in the study came within this 500 lb tolerance range; and, hence, in normal trade usage, would require no weight adjustment between the shipper and consumer of the scrap.

Some gross weights short

A net weight, as the term implies, is a residual of the gross minus the tare weight. It was deemed necessary to distribute both the gross and the tare variations in a similar manner to determine the composition of their averages, 309 for the gross and 987 for the tare.

Again assuming this sample to be representative, nearly 69 pct of the cars will have a mill gross weight greater than the shipper gross weight as furnished by the railroad. About 22 pct of the cars shipped to consumers will develop shortages in the gross weight and 9 pct will have no variation in gross weight. Although the 500 lb tolerance factor referred to above is not applicable to gross weights, it is interesting that 1283 or 60 pct of the cars came within this range, as compared to 36 pct for the net weights.

From the study on tare weights, (see chart), consumers will show a heavier tare than the shipper on 82 pct of the cars shipped. Thirteen per cent of the cars will have a mill tare less than the stenciled tare on the car and 5 pct will have no variation in tare weight. The average overage on the 82 pct is much greater than the average shortage on the 13 pct which had shortages in the tare weight. Using the 500-lb tolerance factor only 709 or 33 pct of the 2135 cars would have come within this range, had it been applicable to the tare variances.

Particular attention is directed to the rather surprising results shown on gross weights, which reveals that as far as gross weights alone are concerned, the mill weights tend to favor the shipper, rather than to penalize him. These data also show that there is a reasonable agreement, on the average, between the shipper and mill gross weights.

Because weight variations might be related to the types of scrap shipped in the various cars, further analysis of the same 2135 cars was made, in order to develop figures on weight variations by grade of scrap. The results are given in Table I. The uniformity with which all grades of scrap show a weight shortage in the final net return, due in every classification to a greater actual than marked tare is striking. In addition, in five of the six classifications, an actual overage in the gross weight is present.

Car cleanout a factor

The variation in final net returns between the different grades is somewhat difficult to understand, particularly why the so-called "premium grades" should show the greatest shortage. The fact that scrap of railroad and industrial origin shows the smallest shortage may possibly be due to the fact that this class of shipper tends to clean out cars better before loading, thus reducing the amount of the tare variation.

Variations between the three consuming mills are included in Table II. All three mills report an average shortage in the net weight. These shortages are attributed to the uniform heavier tare reported by the mills. The relatively greater shortage on cars shipped to Mill C results chiefly from the absence of any overage in the gross weight to offset the variation in the tare. The uniformity with which the actual tare exceeds the marked tare at all three mills by approximately 1000 lb per car

TABLE I

VARIATIONS BY GRADES OF SCRAP

Class of Scrap	Variations in Pounds Gross	Net	Tare
Premium Grades—Electric Furnace use	294	1217	−923
Heavy Melting Steel (#1 and #2)	279	1145	−866
Miscellaneous Grades (Cast, Busheling, etc.)	−17	721	−738
Bundles (#1, #2, and Electric Furnace)	491	1109	−618
Turnings and Borings	367	887	−520
Railroad and Industrial Origin Scrap	280	740	−460
Overall Average	309	987	−678

TABLE II

WEIGHT VARIATIONS BETWEEN MILLS

Consumer	Variations in Pounds Gross	Tare	Net
Mill A	398	1007	− 609
Mill B	195	913	− 718
Mill C	− 85	1122	−1207
Overall Average	309	987	− 678

is particularly interesting.

Weight variations might be expected to fluctuate from time to time, so the figures were broken down into six periods of 10 days each, and the resulting figures compiled into Table III. The fifth period alone showed any significant deviation from the overall average. In each period including the fifth there was an average overage in the gross, a much larger overage in the tare, and a resulting shortage in the net weight.

Based on tare weights

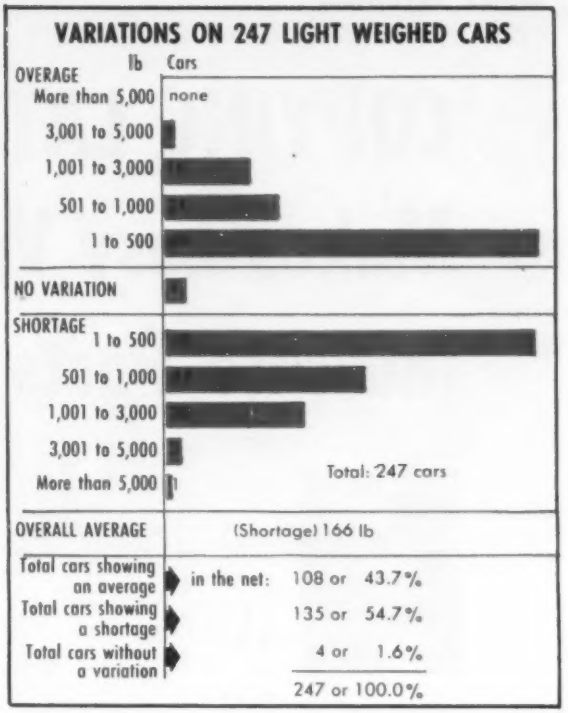
An effort was made to analyze the consistent tare variation which was responsible for the shortages. On all the cars so far used in this study, the shippers' weights were based on railroad weights. Railroad net weights depend on the marked, or stenciled, tare of the cars. In some cases, however, shippers do not rely on railroad weights using the marked tare, but either ask the railroad to light weigh the cars before loading, or light weigh the cars themselves.

A supplementary study was therefore made on the 247 cars which had been light weighed before loading and had been shipped during the sixty days to the three mills involved. On these cars the shippers rendered invoices using an actual, rather than a marked tare. The marked tare, although not used, was however known. (These 247 cars are not a part of the 2135 cars hitherto referred to.)

Marked tare unreliable

The analysis of the 247 cars showed that they had an average shortage of only 166 lb, as compared to the 678-lb average shortage for the 2135 cars not light weighed. Had the marked tare of these 247 cars been used instead of an actual tare, the average shortage would have been 1079 lb. Table IV shows the breakdown of these figures.

The significance of these figures is at once apparent. The light weighing of cars greatly reduces the average shortage (in this instance by 85 pct) to an insignificant figure. Evidently the chief cause of tare variations and resulting weight shortages is the unreliability of the marked tare.



A distribution, similar to the large chart (2135 cars) of the net weight variation on these light weighed cars is given in the chart on this page. With the removal of the factor of the unreliable marked tare, it is noted that the cars fall into a more normal distribution. This is what one would more or less expect when comparing two different weighings of approximately the same object.

There is a much better balance between cars that are overweight and cars that are short. The overages offset the shortages to a great degree, producing a negligible weight variation, speaking in terms of averages and the 500-lb tolerance used by the industry. Attention is called to the almost complete absence of cars with huge weight variation; also to the fact that 57 pct of the cars now come within the 500-lb tolerance.

TABLE III

PERIODIC WEIGHT VARIATIONS

By 10-Day Periods

Ten-Day Periods	Variations in Pounds		
	Gross	Tare	Net
First	241	668	— 427
Second	395	1022	— 627
Third	361	1137	— 776
Fourth	565	1018	— 453
Fifth	36	1239	—1203
Sixth	274	955	— 681
Overall Average	309	987	— 678

TABLE IV

WEIGHT VARIATIONS

Light Weight Cars*

	Average Variations in Pounds		
	Gross	Tare	Net
Using Actual Tare	297	463	—166
Using Marked Tare	297	1376	—1079

* 247 cars so weighed.

COPYING LATHE Makes Easy Work of Short Run, Intricate Parts

By B. D. Miller
Production Enigneering Manager
and

George Kudash
Chief Process Engineer
Jacobs Aircraft Engine Co.
Subsidiary of
Barium Steel Corp.
Pottstown, Pa.

◆ Heavy metal removal, close Air Force tolerances and difficult contours presented a turning problem to Jacobs Aircraft Engine Co. in its production of short run aircraft parts . . . To handle this type of work the company chose a hydraulic copying lathe.

◆ Although suitable for long as well as short run production, the quick setup features of the machine make it particularly desirable for work of this kind . . . Parts range from a 2¼ x 75-in. spline shaft to a bearing housing less than 3 in. in diam . . .Shafts having large shoulders on each side of a large center OD can be machined in one setup.

◆ MACHINING SHORT RUN lots of aircraft gears, shafts, couplings, housings and other engine parts presented a difficult turning problem to the Jacobs Aircraft Engine Co., subsidiary of Barium Steel Corp. These parts, shown in Fig. 1, require large amounts of metal removal, closely held tolerances and most important, the turning of difficult contours. Added to these factors are lengths up to 75 in. which must be turned to small diameters, tough alloy steel material and a minimum 125 microinch finish.

To handle production of these parts, Jacobs selected hydraulic copying lathes. Parts to be machined range in size from a 2¼ in. x 75 in. spline shaft, shown in Fig. 1, to a bearing housing less than 3 in. in diam. Although suitable for long as well as short run production, the quick setup features of the machine made it particularly useful for this work. An especially difficult job is the 9-in. diam gear shown in Fig. 2. The finished hub diameter was forged with a large fillet leaving a considerable amount of metal to be removed.

Two cuts, usually requiring two operations, would normally have been taken to bring this diameter to size. With the contour lathe, after a quick setup and using only one tool both cuts are taken in sequence. The final cut, giving a finish well within specifications, holds the diameters consistently within the 0.001 in. tolerance specification. The lathe, designed by George Fisher, Ltd., Switzerland, and manufactured under license in this country by the New Britain Machine Co., New Britain, Conn., is able to perform this and more difficult turning operations because it has been designed solely as a profiling lathe. Built from the ground up to do profile single point tool turning, it is not a modification of an existing lathe design and does not make use of profiling attachments.

The first feature apparent in this lathe is the location of the cutting tool which is positioned beneath the work, moving on a vertically-mounted slide. The vertical positioning of the tool, as contrasted with the normal horizontal location, makes an unusual degree of rigidity possible.

Chips fall to a pan beneath the work rather than clinging to tools, tool holders and cross slides. The operator has ready access to the

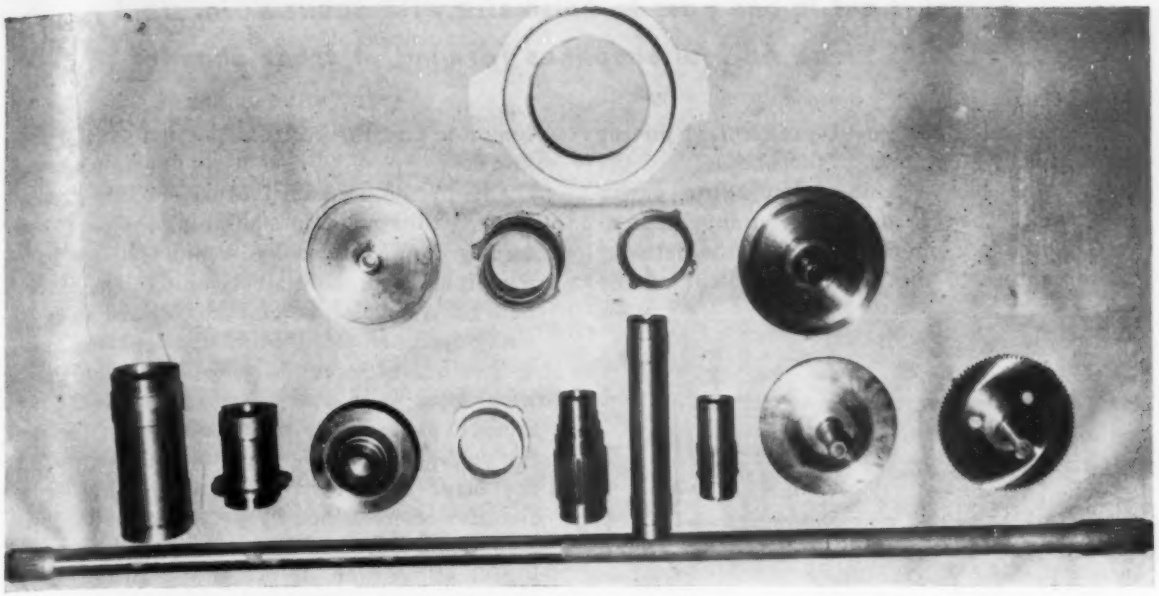


FIG. 1—Variety of short-run items produced at Jacobs makes them "naturals" for turning on profiling lathe.

centers or chuck for loading the workpiece. This makes it possible to move the work forward into the machine rather than "up and over" the compound and in the center of the machine as in conventional lathes.

Coolant is readily applied through the tool holder from the easily accessible front open space and the cutting operation is protected from splashing without elaborate guards. Finally, the vertical positioning of the tool permits vertical positioning of the tracer template at the front of the machine where its action is easily visible. Adjustments are possible so that the taper, even up to ten thou-

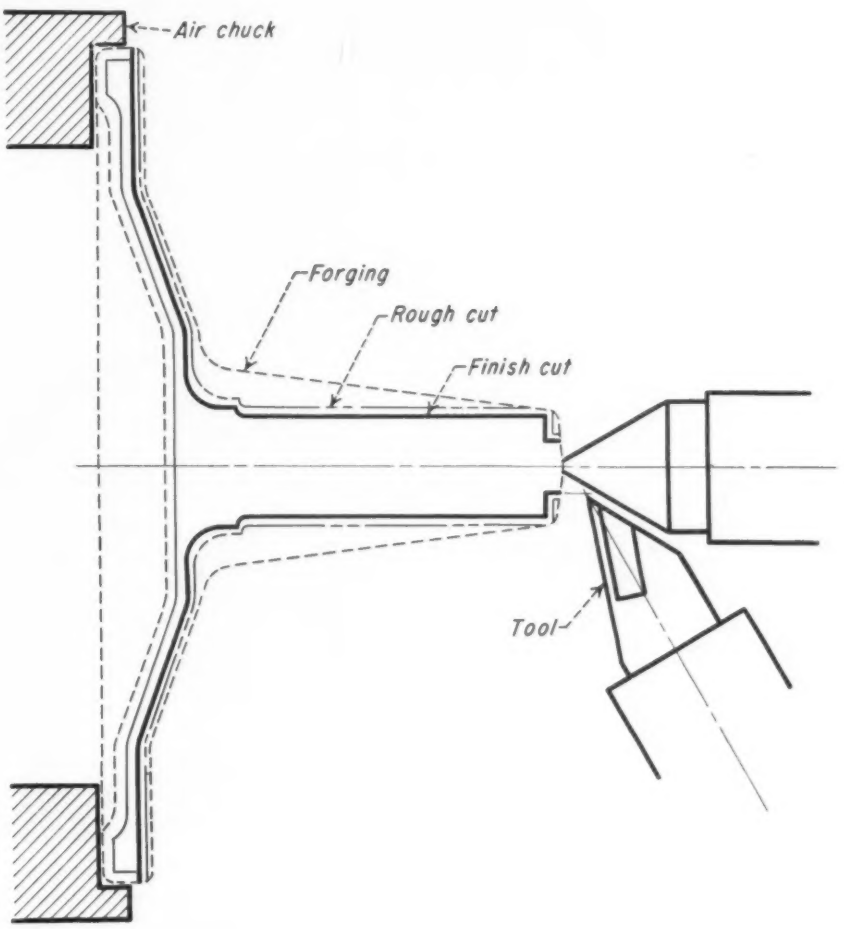


FIG. 2—This 9-in. diam gear is turned in two passes using only one tool. Tolerance held is 0.001 in.

Barrel is cut in one pass to finish size with about 1/4 in. stock removal . . . A 45° lead on tool simplifies forming of front chamfer . . .

sandths of an inch, may be controlled on the two centers which support the bar holding the tracer. The bar, running almost the entire length of the bed, is such that on shorter templates, there is a larger ratio of the adjustment of the centers to the actual movement of the template and the resulting action of the tracer and tool.

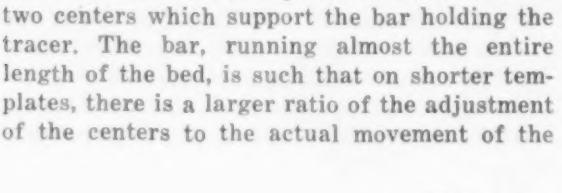


FIG. 3—This hydraulic cylinder barrel machined from 4130 steel tubing is cut in one pass to finish size with about 1/4-in. stock removal on the OD.

One of the unusual features of this profiling lathe is illustrated in machining the part shown as Fig. 3. This is a hydraulic cylinder barrel machined from 4130 steel tubing. The stock is held on a special arbor and chucked in a specially-designed self-locking chuck shown in Fig. 4. The barrel is cut in one pass to finish size with about 1/4 in. stock removal on the OD. The difficult part of this operation lies in the need for cutting a full 45° chamfer on each side of the large diameters. Forming of the "front" chamfer is simplified by grinding the tool with a 45° lead. But the "forward up" cut, shown in Fig. 3 at position A, presents a problem. The Fisher lathe has automatic feed change mechanism which makes it possible at this point to change the feed. This mechanism is shown in

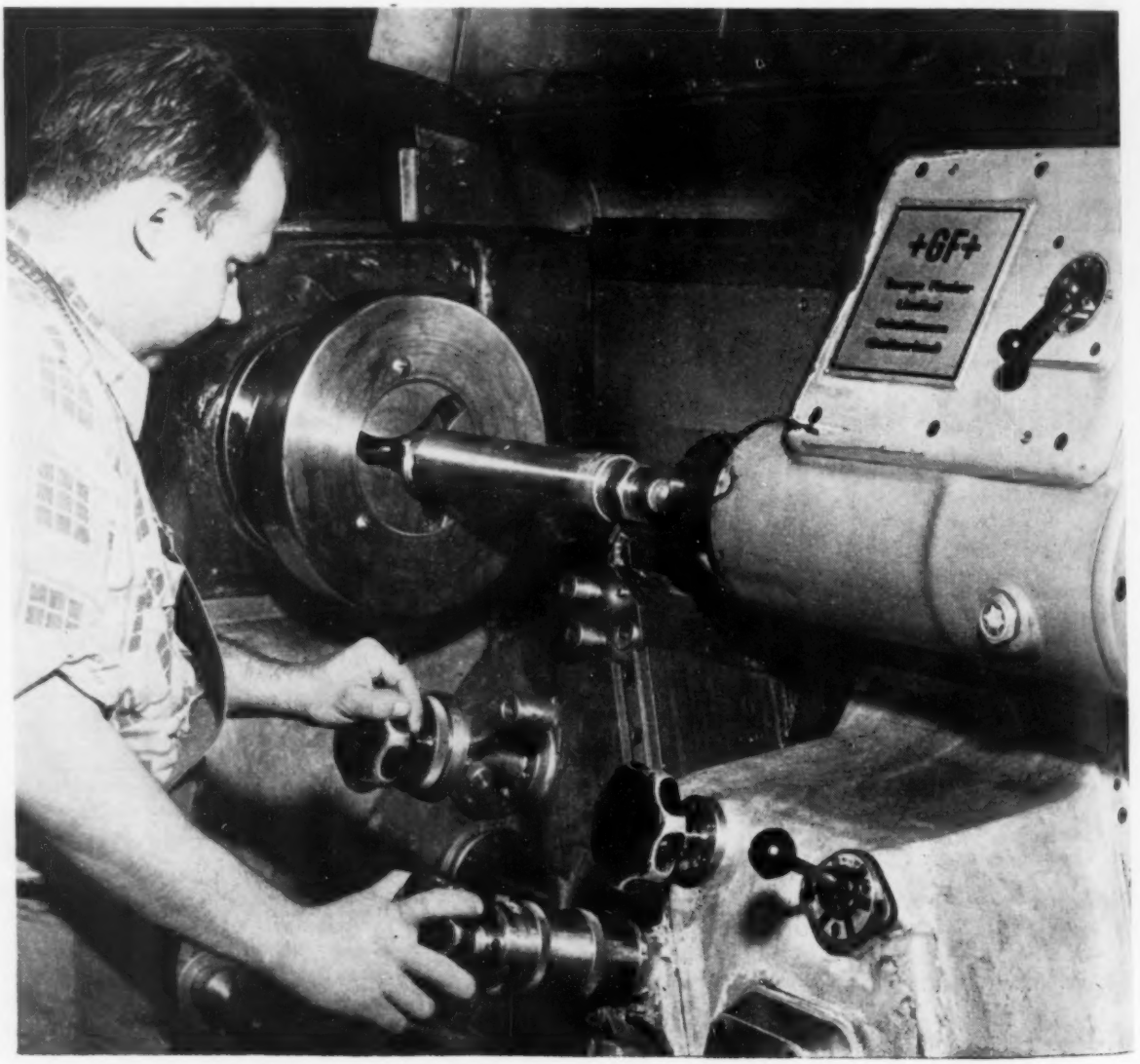


FIG. 4—Cylinder barrel is held in specially-designed self locking chuck. Automatic feed change mechanism makes possible forming of 45° chamfer at A in Fig. 3. Recommended limit on this angle is 30°.

the foreground and beneath the operator's hand in Fig. 4. The 45° angle can be machined satisfactorily, although it exceeds the 30° limit recommended by the manufacturer.

When tooling a job such as shown in Fig. 5 there is a choice of two methods. The part may be machined first by turning the one end, shown in Fig. 6, and then either in a new setup or on a second machine, turning the other end. It is possible on the copying lathe, however, to set the part up with two templates and two tools which cut alternately, see Fig. 5. The dual cut on the largest diameter is not usually required. When an additional machine is not available, however, this second method makes possible faster and earlier production of finished parts. This is a unique approach to the problem of machining completely in one setup, shafts or other parts which have large shoulders on each side of a large center OD.

In addition to regular profile turning, attachments either manually or hydraulically controlled make possible the cutting of recesses or grooves. All tools on these machines are carbide and the most common shank cross section, 1 11/32 x 1⅞ in., provides extreme rigidity and makes maximum speeds possible. The micrometer adjustment on the machine is rugged and tooling setting gages supplied with it make tool readjustments quick and simple.

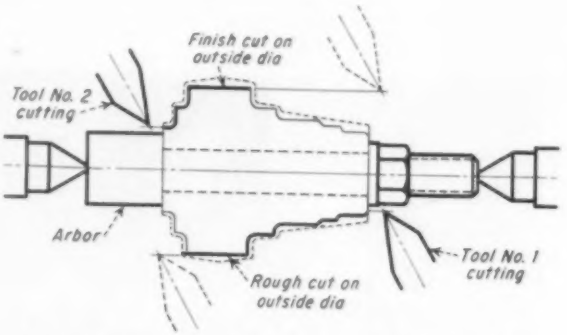


FIG. 5—On profiling lathe it is possible to setup this part with two templates and two tools which cut alternately. Dual cut is usually not necessary.

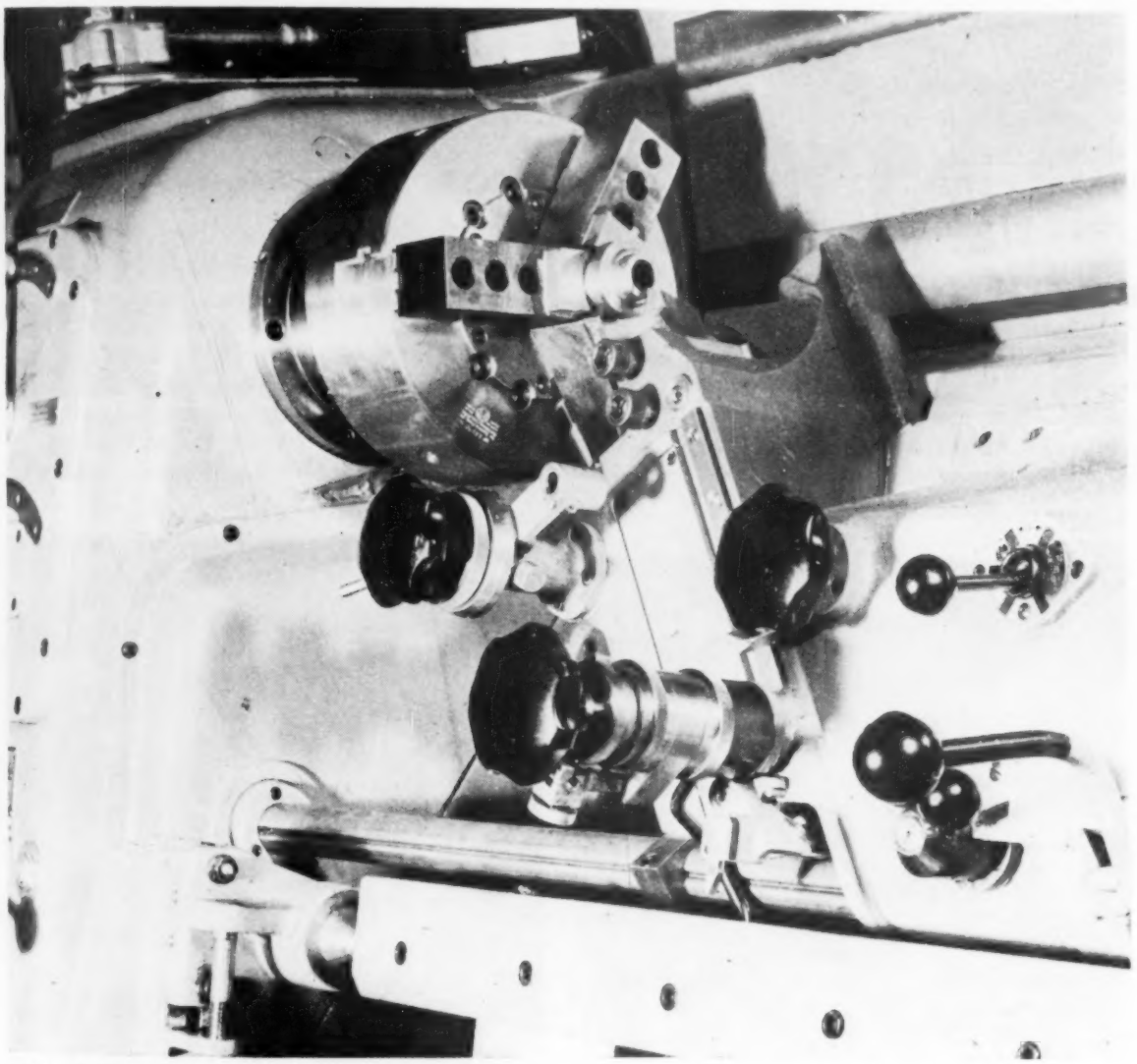


FIG. 6—The part sketched in Fig. 5, above right, may be machined first by turning one end in one setup, as shown here, and then turning the other end in a new setup or on a different machine.

Guinea pig casting—

Complex Aluminum Part

By R. V. Heath
Metallurgist
Washington State Institute of Technology
Div. of Industrial Research
Pullman, Wash.

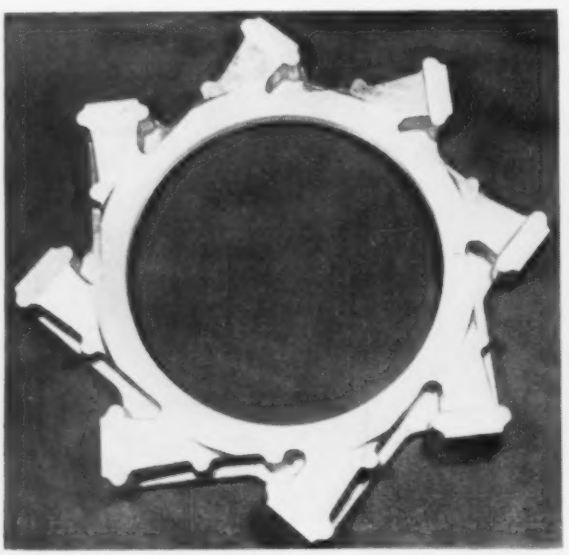
◆ Shell molding has replaced machining in making diffuser disks, a complex aluminum part for Boeing Aircraft's new gas-turbine engine . . . The part's complicated geometry and high surface finish requirements made it a suitable "guinea pig" in a search for less costly methods of making the engine parts.

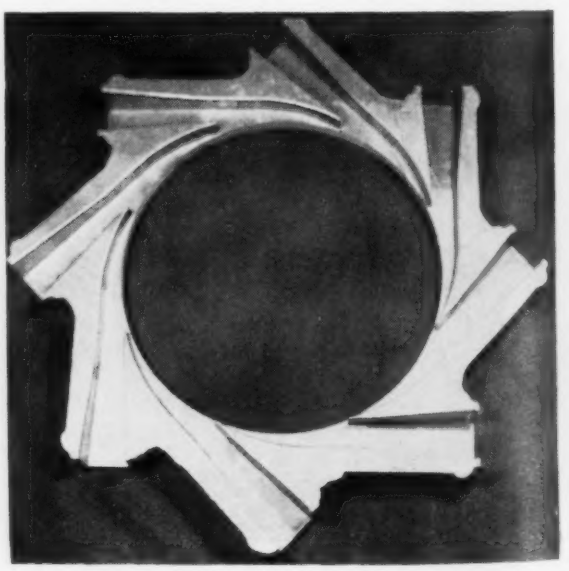
◆ The big diffuser disks, 17 in. in diam, are poured in a horizontal plane . . . As-cast surface finish is close to the required 32 microinches rms . . . Parts are cast from an SAE 323, aluminum alloy . . . Pouring temperature is 1250°F.

◆ COMPLICATED ALUMINUM castings for Boeing Aircraft's new gas-turbine engines are being successfully shell molded. The complex compressor diffuser casting, formerly machined from a billet, was used as a shell mold "guinea pig" in a search for a less costly method of manufacture. The method proved successful and parts have an as-cast surface finish approaching 32 microinches rms. Castings are free from microshrinkage and porosity. Procedure for shell molding the part was developed by the Div. of Industrial Research of the Washington State Institute of Technology.

Heart of Boeing Aircraft's powerful little gas-turbine engine—it delivers over 1 hp per pound of weight—is the compressor unit which prepares the fuel mixture for combustion.

It is advantageous to produce compressor

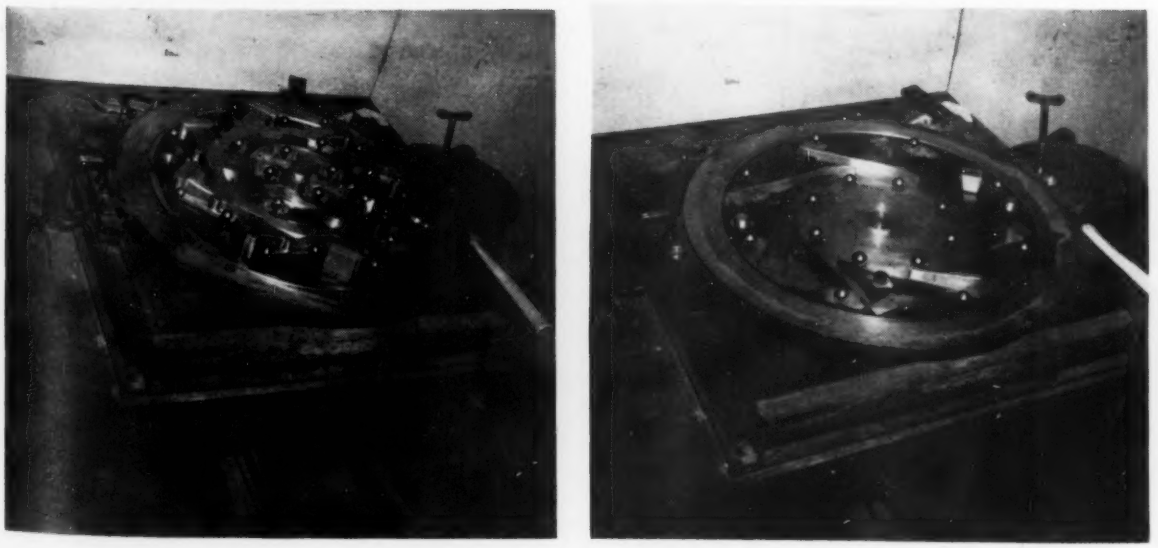




COMPRESSOR diffuser casting with gate removed, cope side at left, drag side at right.

Successfully Shell Molded

CASTING IS POURED in SAE 323 aluminum with parting line in a horizontal plane.



MATCH PLATE for cope, left, showing ejector pins and gating. Right, plate for drag half.

Tests on pie-shaped sections pointed the way to the best casting method . . . Pouring, type of ejection pins were changed . . .

parts by casting, but conventional green sand molding does not produce the desired results. Boeing machines some parts from billets. This method was undesirable from both cost and production standpoints.

Boeing approached the Div. of Industrial Research for an answer to this problem. Shell molding techniques offered a possible solution to problems of geometry and surface finish.

The aluminum diffuser casting is a hollow disk with a 17-in. OD and 10-in. ID. It also has a variety of section sizes and contains eight symmetrically placed air passages. Boeing's specifications for this part call for a surface finish equivalent to 32 microinches rms in the air passages. This finish is produced in the as-cast condition to eliminate costly machining operations.

Because the diffuser casting is symmetrical, it was decided to begin the work by casting a one-eighth pie section. It was hoped that by casting this section data could be gathered on problems of gating, risering, and surface finish.

Wooden patterns allowing three shrinks were made of the pie section. These were used to cast aluminum patterns. After the castings had been checked dimensionally and shown to be correct, they were finished all over and assembled on a match plate with ejector pins, alignment pins and a gating system. They were now ready to make resin-bonded molds of the pie section.

CURED MOLD HALF is stripped from the match plate. Hydraulic jack activates a platen against spring loaded pushouts.

Gating on this small section consisted of a down sprue with a 3:1 taper and a choked ingate located in the thin section near that part which would be the boss farthest from the center of the casting. Such a gating system permits the shell mold to be stood vertically while pouring, as is customary with this type of casting.

Castings of this pie section contained shrinkage, and difficulty was encountered in ejecting the cured shells from the match plates. More often than not the ejector pins were pushed through the shell rather than ejecting it from the pattern. Surface finish, a function of the finish of the pattern and fineness of sand used, did not prove to be a major problem.

It appeared certain that shrinkage and shell ejection troubles would be considerably magnified when the entire casting, rather than just a section, was attempted. If the casting were poured with the parting line in the vertical plane according to usual shell molding practice, it would be necessary to gate into the thin outside section. The prospect of pouring a successful casting with such a gating system did not appear favorable. It was decided instead to pour the shells on the horizontal. In this position, it is possible to gate from the inside into the heaviest section in the casting.

Up to this time, flat head ejector pins had been used. These frequently pushed through the shell. The flat head pins were replaced with button head pins. These exert pressure over a greater area and have less tendency to punch through the shell. The button head also tends to keep the investment mixture out of the groove in which the shank of the pin travels.

Aluminum, magnesium used

Aluminum and magnesium were chosen for the final patterns and match plates because of their lightness and ease of machining. Although there has been much prejudice expressed against the use of aluminum and magnesium as pattern materials, experience here has shown them to be satisfactory.

Construction of the final match plates was begun by taking the wooden three-shrink cope pattern of the pie section and casting it in aluminum. This aluminum casting, still containing two shrinks, was then used as a pattern to cast enough of the pie sections to make a complete pattern. Each individual casting was faced off on the bottom and finished on all surfaces. These eight pieces were then placed on an aluminum plate.

In making the drag half of the pattern with its eight air passages a two-shrink wooden pattern was made and a large circular disk of

magnesium was cast. The final drag pattern was machined from this disk. To these final match plates were attached alignment pins, ejector pins, and the gating system.

Alignment pins used are of the truncated cone variety with 10° to 15° draft. With two match plates it is convenient to locate the male pins on one pattern and the female on the other pattern. Depth of the female should be slightly greater than the height of the male so the mold halves will close completely.

Ejector pins are spring loaded so that they are held in the retracted position during the investment cycle. A hydraulic jack activates a platen simultaneously against all the spring loaded push out pins. Thus the rate of travel of the push out pins is the same and shells cannot tilt and bind on the pattern.

Since the diffuser casting was to be poured in the horizontal position, air passages were placed in the drag and the gating system was attached to the cope match plate.

The first gating system tried consisted of a 1-in. diameter pouring basin, a 2-in. untapered down sprue and eight radial runners from the sprue to the heaviest sections in the casting.

SHELL MADE from cope match plate on table. Plate was cast in pie-shaped sections.

Individual runners were eliminated in favor of a gating system around the inside periphery . . .

Runners were tapered in cross-section from ¾ x ¾ in. at the sprue down to 1 x ¼ in. at their point of attachment to the casting. With this system several castings were made, all of which contained some shrink.

Since this shrink was thought to be caused by early freezing of the runners, individual runners were eliminated in favor of a gating system extending around the entire inner periphery of the casting, and equal in height to that of the casting at the points of attachment. What was to be a large hole in the center of the final casting was now entirely gate except for 1 in. diameter holes around each of the ejector pins. This gating system consistently produced sound castings.

Initial work was carried out with a round-grain Ottawa sand with a No. 60 fineness. After the problems had been ironed out and a satisfactory gating system arrived at, a sub-angular silica sand of No. 100 fineness was substituted. With this finer sand, castings with surface finishes on the order of 40 to 32 micro-inches rms can be produced.

First step in the shell molding process is the molding mixture preparation. A laboratory size Mulboro with mulling times of about 20 min produced a satisfactory mix.

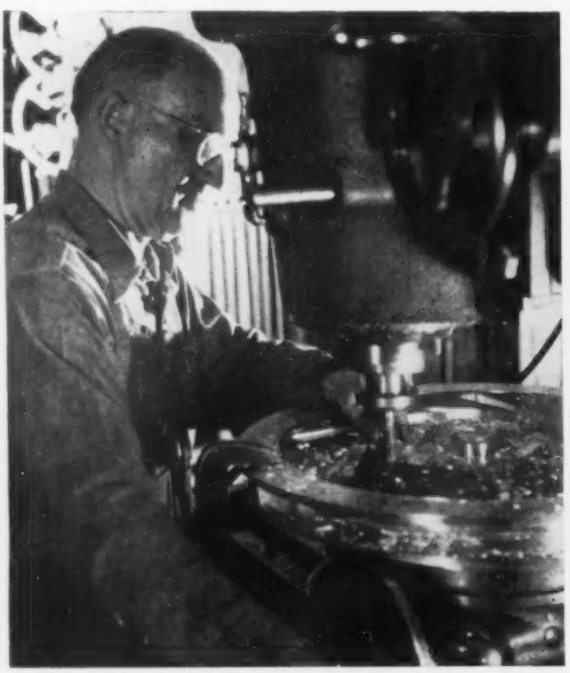
This prepared mix is then placed in the dump box. The match plate is heated to 500°F and a silicone release agent applied. The match plate is then clamped in the dump box and invested with the resin-sand mix. After 5 to 7 seconds the match plate is removed from the dump box with the partially cured resin-sand shell adhering to it, and is placed under an infra-red lamp having a total output of 8000 w for curing. After 3 to 5 min of curing, the shell is ready for stripping. Cured shell half-molds are then stripped and fastened together in the following manner:

1. Four holes—one on each side of the pouring basin—are drilled in the shell and ¼ x 2 in. cap screws are used to securely fasten the center of the molds.

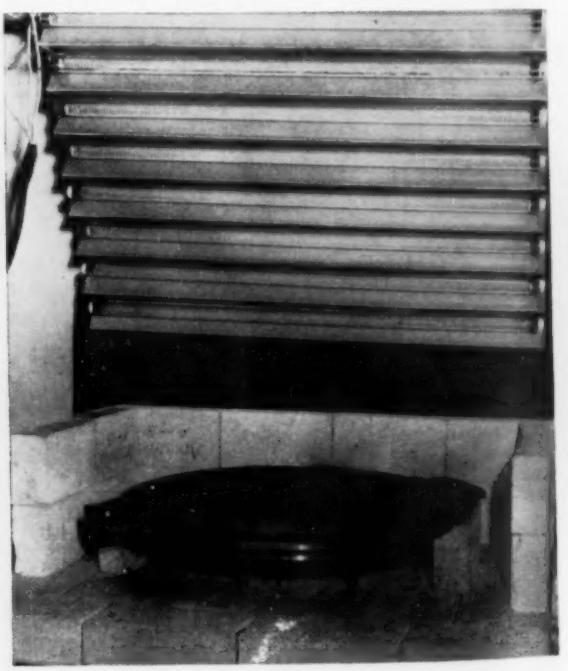
2. The periphery of the shells contain a tongue and groove which completely encircles the casting. The groove being deeper than the mating part, can receive an adhesive and the half-molds will still close completely and maintain the dimensional accuracy desired.

After the shell half-molds have been securely fastened together the mold is readied for pouring by bedding down the drag in molding sand. This is used only to support the bottom shell during pouring, and it is not necessary to bury the mold.

Parts are cast of Reynolds aluminum alloy No. 356 (SAE 323) which was melted in a graphite crucible in an oil-fired furnace. A pouring temperature of 1250°F produced the most satisfactory casting.

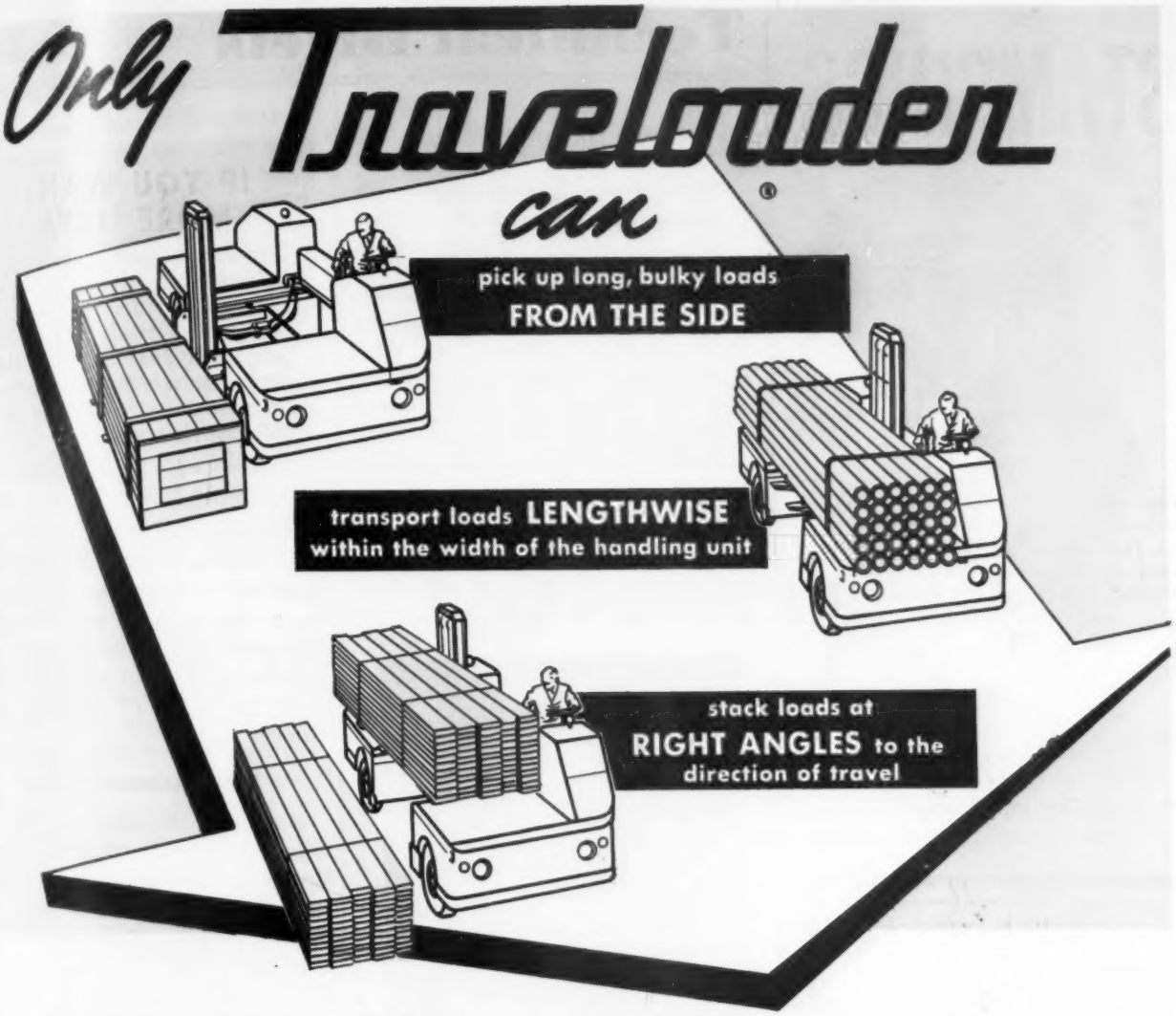


VARIETY of section sizes and eight symmetrically placed air passages made careful machining of pattern and match plates of prime importance.



PARTIALLY CURED resin-sand shell is removed from dump box and cured in 3 to 5 min under 8000-w infra-red lamp.

Only Traveloader can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within the width of the handling unit
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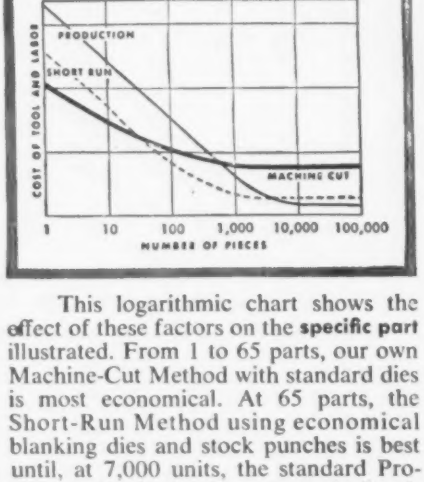

This logarithmic chart shows the effect of these factors on the **specific part** illustrated. From 1 to 65 parts, our own Machine-Cut Method with standard dies is most economical. At 65 parts, the Short-Run Method using economical blanking dies and stock punches is best until, at 7,000 units, the standard Production Method with standard dies is most satisfactory.

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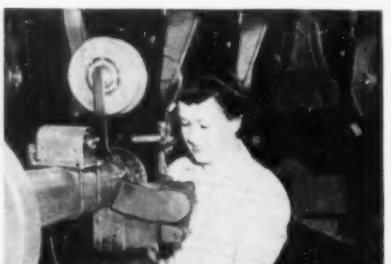
Technical Briefs

FASTENING METHODS:

Improved wire stitching setup gives production versatility.

Greater versatility in stitching operations on job lots of automobile components has been attained at Woodall Industries, Inc., Detroit, through careful planning of stitching machine assembly lines.

Production lines of Woodall Industries, Inc.—Detroit fabricators suplying major automotive manufacturers — include 44 stitching machines permitting rapid and economical assembly of certain automobile components.



MOVEMENT OF COMPONENTS is speeded through assembly lines of Woodall Industries, Inc., wire stitching specialists, by use of overhead and table height conveyors.

METAL PARTS in this heater chamber are secured to fibreboard with metal stitches. Chamber, assembled with stitching machines, has close seal at edges.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 83. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Engineers of both Acme Steel Co., Chicago, and Woodall cooperated to determine how stitching machines could solve Woodal's fastening and assembly problems. Results show up in three assembly lines made up of stitching machines.

Three Assembly Lines

Machines include both carton-type and metal-stitching units. Matching the type machine to a specific job is dependent upon material hardness and thickness as well as resistance to penetration. Where stitching to metal is not required, standard carton-type Silverstitchers are used.

Economical and Fast

Where automotive heater parts made of thermoplastic fiberboard must be joined together in a near airtight condition, this machine proves an economical and rapid method of fastening. A "sealing" stitch may be rapidly applied around the outer edges where two layers of fiberboard must be joined together.

Products from the assembly

METAL AND CARTON stitching are required in assembly of this heat exchanger-to-dash duct. Metal collar permits mounting part to automobile fire wall.

lines include a heater distribution duct, a heat exchanger-to-dash duct, and a heater plenum chamber. In each, the fiberboard is heated and formed on die presses. The pre-formed basic parts are then transferred to assembly lines where the required metal parts are stitched in place.

Most complicated assembly is the heater distribution duct which requires three separate metal-stitching machine operations followed by the "sealing" stitch performed by carton-type stitching machines.

Basic Combinations

These operations include a felt-to-metal stitch, a metal-to-metal stitch and a metal-to-fiberboard stitch, followed by the fiberboard-to-fiberboard stitch. Stitches are also used to secure the spacers providing the necessary gap to permit air to flow into the passenger compartment of a car.

Preformed fiberboard halves of the heat exchanger-to-dash duct, are joined with stitches of flat wire. Carton-type stitching machines easily join the two 0.093-in. thick fiberboard sections.

Stitches of 18 gage wire are used to secure an 0.065-in. rubber-covered metal collar to the end of the duct after the two halves have been joined. This metal collar is used to permit bolting of the duct assembly to the automobile fire wall.

Heater plenum chambers include a butterfly-valve defroster control. This particular piece requires a metal-to-fiberboard stitch as well.

Lubricates at Low Temperatures

Successful operation in the range from −100° to 250°F is claimed for a new grease developed by the Texas Co. to meet lubrication needs in long-range stratospheric flight.

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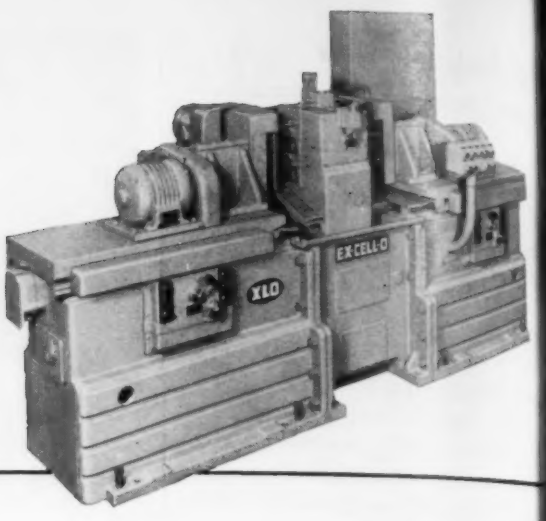

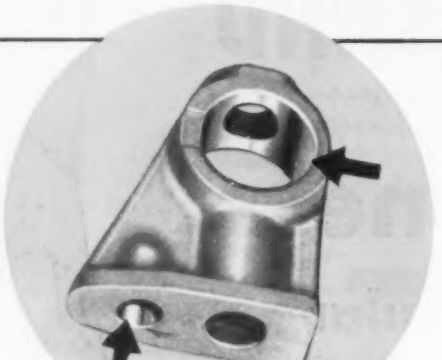

Photo above shows one of the die-cast aluminum workpieces. Arrows point to the bored holes which are held to plus or minus .0005". Four parts are machined during each cycle, netting 822 pieces per hour.

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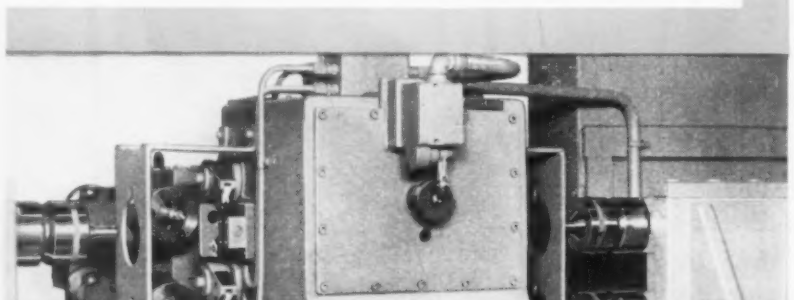
This Ex-Cell-O three-Way Precision Boring Machine consists of three standard, self-contained way units joined to a center section. The left and right way units have two spindles each, mounted one above the other on angle plate brackets. The rear unit carries four spindles, two on each side. The center section supports a fixture accommodating two parts on each side. Work is clamped and ejected hydraulically.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Two parts are held in each side of the fixture. Left and right slides bore 13/16" diameter hole through each part, while rear slide is boring 5/16" blind holes at right angles to the others. The work is unclamped and ejected automatically at the end of the machining cycle.

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Quick Pace of Orders Belies Any Early Steel Slacking

Fourth quarter books are filling fast . . . Certain to be large carryovers of undelivered third quarter orders . . . Ingot rate advances one point to 97.0 pct.

Steel business looks good for the rest of this year at the rate orders are being booked. The only thing that could make it fall on its face would be an epidemic of cancellations. That could still happen, but it isn't being expected as loudly as it was a few weeks ago.

Consumers haven't given up the ghost yet; they are still very active in the market. So much so that they continue to amaze producers with the persistence of their demands.

It seems certain that fourth quarter order books on most major products can be filled with a minimum of time and trouble.

Users Need Steel . . . Of course these orders can be cancelled. But talking to consumers you don't get the idea they have that in mind. They plan to use the steel to support production schedules and to rebuild their inventories.

There will be heavy carryovers of undelivered third quarter orders going into the fourth quarter. This applies to most flatrolled products, especially sheets; large sized bars, both carbon and alloy; and some sizes of plates and structurals.

Don't Want Conversion . . . But the bloom is definitely fading from premium priced steel. Conversion offers attract little attention, although some of this high priced material is still being delivered on old contracts. And most high cost producers charging premium prices for their products have declined risking a price increase. Result is that their premiums over regular mill prices have been shaved, and their prices are more nearly competitive.

Warehouses, too, report sales have slowed from the feverish pace of few months ago. However, their inventories are still unbalanced and they would like to get more tonnage of popular items from the mills. As is usually the case, items easiest to get are hardest to sell.

Depends on Detroit . . . Much depends on what happens to the auto industry during the later part of the year. Steel buyers there are beginning to play their hands from close to their chests. They obviously feel they will be able to fill their steel needs without resorting to expensive sources which had been raising their costs sky high—$25 or more per car in some cases.

One of the biggest users in the area is buying on 4 months' lead time; its buyers are told not to make commitments past October. Meanwhile steel people are more optimistic than they have been for several weeks; they expect business to remain excellent for the rest of the year with only a little slack in the waning months. This is quite a turnabout from the past when steelmakers were "cautious" and automakers were "optimistic."

Shutdowns Short . . . Don't look for any prolonged shutdowns for automotive model changes this year. Except for some of the companies that already have car inventory troubles, production will be maintained at high level right up to changeover date. Changeovers don't result in the lost time and production they once did. One large automaker is planning to change models with only one week of lost production.

A sudden easing of some alloy steels is attributed to government cutbacks in vehicle programs—trucks and tanks. Military users failed to pick up all the June set-asides (30 pct in alloy steels).

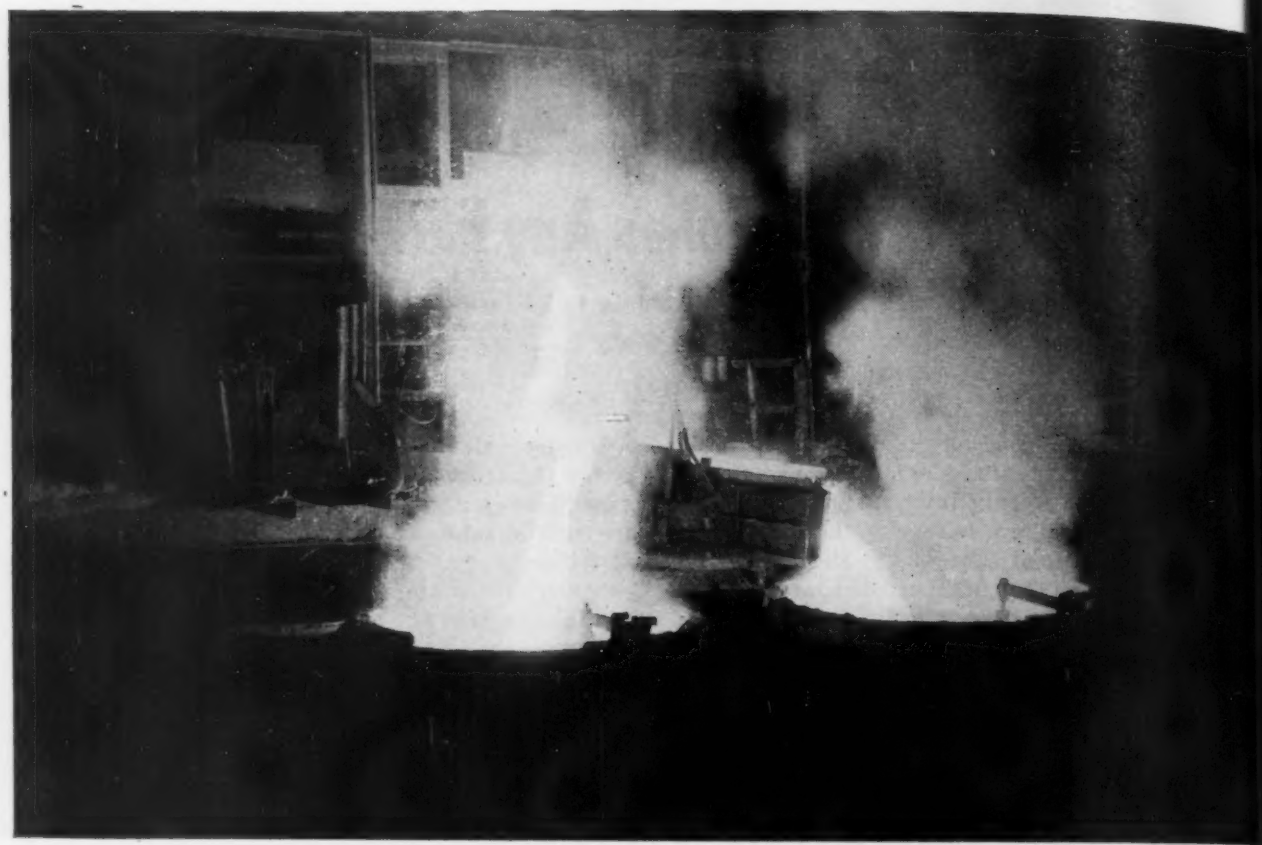
Steel sales people report cancellations are few and far between. Those that have occurred are attributed to changes in defense requirements, strikes, or some other abnormal reason. They are definitely not factors in this market.

Stocks Look Bigger . . . Reason for watching cancellations so closely is that once they start they can spread like wildfire. Even a moderate cutback in manufacturing schedules can spread steel inventories a long way. Inventories always look larger when other people are cancelling orders.

Also, a decline in demand for one product may release a lot of steel that can be turned into other products. Easing in plate demand could cause mills to turn out more pipe. Or easing in sheets could bring more plates on the market. Within the limits of finishing equipment is considerable flexibility in steel production.

Steelmaking operations this week are scheduled at 97 pct of rated capacity, up a point from last week. Outlook is that the ingot rate will remain in the upper nineties for a while. After that it might rise to a hundred or more and stay there for some time.

Supplies In Good Shape . . . With the exception of some alloys (nickel for example) steelmaking raw materials are in good supply. Iron ore shipments on the Great Lakes are proceeding at a record pace. So are imports. Coke supplies are adequate, and most producers have large stocks of coal. Scrap supplies are ample in most areas, with plenty of material available at the "right" price. Manganese is adequate, if not abundant.



PHOENIX IRON & STEEL COMPANY, Phoenixville, Pa., is one of the nation's olde steel producers. Above, Phoenix open hearth furnace being tapped by bazooka gu

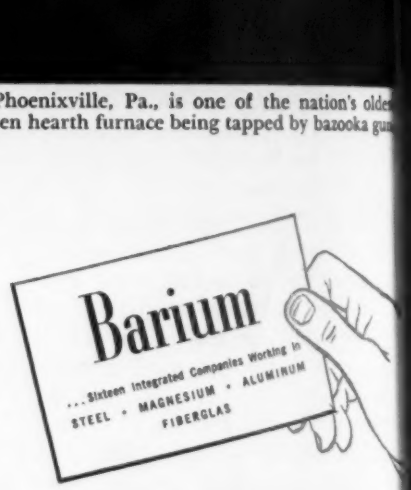
Steel, anyone?

Or, for that matter, aluminum, Fiberglas, magnesium?

Name a basic material on industry's shopping list and chances are that one of Barium's 16 integrated companies has a hand in its production or fabrication.

No other steel producer fabricates so many different products. No other processor can match Barium's ability to turn magnesium, the versatile sea-born metal, into basic structural forms. Barium specialists are also breaking new ground in the utilization of Fiberglas for structural applications, such as aircraft shelters and barges.

This close-knit and fully integrated organization of 16 companies offers you a wealth of top-rank engineering talent and extremely flexible production facilities. They can take excellent care of your requirements for structural and fabricated materials, whether routine or highly specialized. We'll be glad to tell you how. Just drop a line on your company letterhead direct to Barium Steel Corporation, 25 Broad Street, New York 4, N.Y.

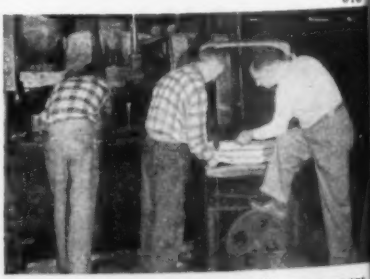


BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.

3.6

INDUSTRIAL FORGE & STEEL, INC., Canton, O., one of the nation's largest producers of heavy flat-die forgings, works in all types of steels and other metals. Here, titanium is being forged.

AT 60° BELOW, this air-borne Fiberglas-and-magnesium alert shelter protects planes and crews. Designed and built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.



DOUBLE CHECK is given a radiator support for an Army truck by inspectors at Geometric Stamping Co., Cleveland, O., which turns out steel and aluminum stampings for industry.

Market Briefs and Bulletins

Prod Uranium Mining . . . Uranium mining may be stimulated if Congress can agree on a bill to validate mining claims on public land previously leased for oil and gas drilling. Late last week the Senate passed and sent to the House S. 1397, covering claims filed between Jan. 1, 1939, and last Mar. 20. Principal aim of the bill is to give legal force to uranium claims in Colorado, Utah, New Mexico, and Arizona. House committee approval has been given to a separate bill which would produce approximately the same results. The lawmakers are expected to try to work out a compromise measure which both Senate and House will approve.

Build Steel Mill in Brazil . . . Siderurgica Paulista Cia. plans to start construction of its new steel mill at Piassaguera, Brazil, late this year, with completion scheduled for 1956. Ultimate capacity of the mill will be 1 million tons per year. Cost of the mill is estimated at $110 million.

Canada Drops Duty . . . Firms exporting electric motors to Canada were encouraged by a recent ruling that ends the practice of charging a separate duty on electric motors that are attached to machines imported into Canada. Customs authorities will now treat attached motors as one unit, the same way they regard built-in motors. Duty charges had been running as high as 22.5 pct.

Cut Tool Tags . . . Price reductions of 15 to 20 pct have been made on many types of Kennametal cutting tools and tool blanks. Included under the price rollback are single-point brazed tools, roller turners, inserts and boring tool blanks.

Raise Magnet Prices . . . General Electric's Carboloy Dept. has increased prices of its permanent magnets an average of 10 pct. The price rise covers Alnico, sintered and cast magnets.

Crack Down on Exports to Reds . . . New government restrictions prohibit U. S. residents from helping Communist-dominated countries obtain strategic materials, no matter what the originating point of the goods may be. Treasury Dept. has supplemented export laws by forbidding participation in the supply of strategic goods to a Communist country from a third country. Penalties imposed for violation of this order are a $10,000 fine and 10 years in jail.

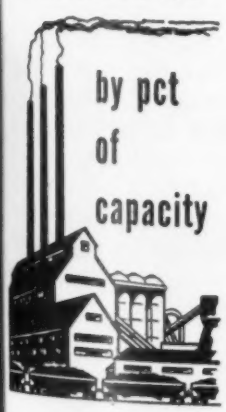
Extend Tariff Suspension . . . House approval was given early this week to two bills covering imports of metal scrap and bauxite. H. R. 5148 would continue suspension of import duties on metal scrap, except lead and zinc, until next June 30. H. R. 222 is designed to suspend import duties on bauxite. Neither bill has been voted on by the Senate.

Steel Shipments Near Record . . . Steel shipments during May amounted to 7,209,396 net tons, the largest monthly total on record except for March of this year, reports American Iron and Steel Institute. Deliveries to the automotive industry set a new monthly record of 1,446,232 tons.

Reline Furnace . . . No. 5 blast furnace at Duquesne Works of U. S. Steel Corp. went out July 11 for relining. No. 4 blast furnace at the Youngstown plant of the company was blown in July 15 after being out since June 15 for repairs to the mantle.

Ask Contract Setaside . . . Justice Dept. wants a New York federal court to set aside a contract under which Alcoa would buy 600,000 tons of aluminum from Aluminum, Ltd., of Canada, to be delivered over a 6-year period. Federal lawyers charge the purchase contract would stifle competition and is contrary to a 1951 court order for disassociation of interests of the firms.

STEEL OPERATIONS

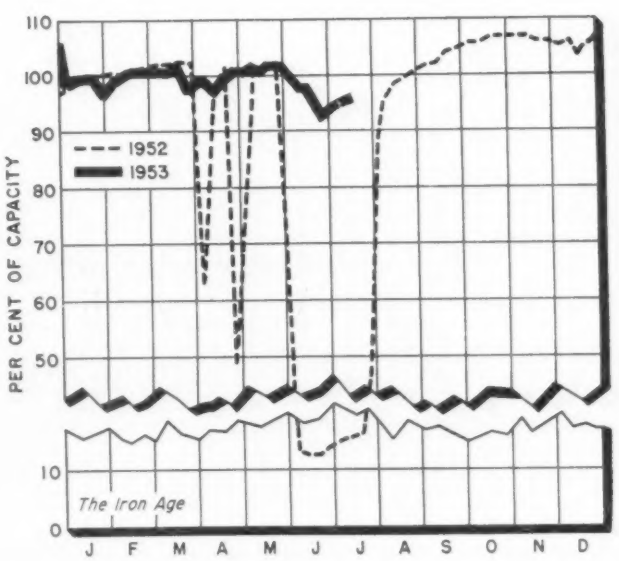


District Operating Rates

District	Week of July 19	Week of July 12
Pittsburgh	97.0	96.0*
Chicago	98.0	97.0
Philadelphia	98.0	97.5
Valley	98.0	97.0*
West	101.0	105.0*
Cleveland	93.0	95.0
Buffalo	106.5	106.5
Detroit	106.0	107.0*
Birmingham (South)	102.5	102.5
Wheeling	100.0	100.0
South Ohio River	92.0	92.0
St. Louis	85.5	85.0
East	57.0	41.0
AGGREGATE	**97.0**	**96.0**

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



Zinc Sellers Study Pricing Shift

AS&R departs radically from tradition, abandons E. St. Louis zinc base . . . Others move slowly . . . Kaiser settles with USW, follows Alcoa price hike—By *R. L. Hatschek.*

Last week American Smelting & Refining Co. departed radically from tradition. The firm has abandoned the East St. Louis basing point for Prime Western zinc and established a price of 11.25¢ per lb delivered anywhere east of the Continental Divide. For western delivery the price is 11.50¢ per lb.

Officially it's a price increase; effectively it's a cut for many consumers in the East.

State Reasons . . . The company listed four reasons for the shifts:

(1) Prime Western zinc has been the only major nonferrous metal for which the price varied greatly according to delivery point.

(2) Increasing rail freight rates have put East Coast and West Coast users at a disadvantage and, in view of uniform pricing for higher grades, have practically ended the advantage of using the lower-priced Prime Western where it is suitable.

(3) Freight premiums at East Coast delivery points tend to offset the effect of the import tariff and put European suppliers in a better competitive position.

(4) Increased steelmaking capacity on the two coasts promises to increase use of Prime Western grade in those areas which already consume more than 50 pct of the total Prime Western supply.

Reaction Slow . . . The move seems to have thrown some confusion into the zinc market. Others would probably like to follow the new setup right down the line but difficulties have presented themselves. Main problem is the one of contracts based on the East St. Louis price for Prime Western zinc.

Some producers have, however, shifted from the standard differential and set up prices for High Grade and Special High Grade. But you can bet that all possibilities are being carefully weighed by producers.

Kaiser Raises Prices . . . Late last week Kaiser Aluminum & Chemical Corp. signed up with the United Steelworkers of America, giving the union an 8½¢ per hour pay boost retroactive to July 13. Immediately after the settlement the firm announced an increase in prices of ½¢ per lb on standard grade pig and 1¢ per lb on standard grade ingot aluminum effective July 20.

Increases in both wages and prices were identical to earlier moves made by Aluminum Co. of America.

New prices for Kaiser's mill products are expected this week. Alcoa's new lists are beginning to be distributed.

Reynolds Signs Two . . . The Kaiser wage settlement covers almost 6000 hourly rated employees at Tacoma and Spokane, Wash., Newark, Ohio, and Halethorpe, Md., represented by the CIO union. About 3000 workers at the Chalmette and Baton Rouge, La., plants are covered by contracts still in effect with the AFL and no wage discussions have yet started.

Reynolds Metals Co. reached an agreement with the AFL Aluminum Workers last week. This calls for an 8½¢ increase at plants in Louisville, Ky., and Lister Hill, Ala., covering a total of about 3500 workers. At press time this firm was still in negotiation with unions at its other plants.

Reynolds has not yet increased prices but it is a certainty that the boost will be made as soon as all contracts have been settled. Aluminum Co. of Canada is also on record as saying that it will remain competitive.

Strike Vote . . . International Union of Mine, Mill and Smelter Workers was conducting the vote over the week end of some 80,000 members employed in the copper, lead and zinc industries. Result of the tabulation to Monday was running approximately 9 to 1 in favor of a strike.

Among the Mine, Mill demands was a pay hike amounting to 15¢ per hour. It's felt the union will adopt a more realistic attitude on this point in view of the 8½¢ per hour settlement in both the steel and aluminum industries, which should be enough of a precedent.

The union says that the strike vote is its answer to refusal of nonferrous producers to recognize "tremendously increased" productivity of workers. Negotiations have been going on since May, but so far without success.

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	July 15	July 16	July 17	July 18	July 20	July 21
Copper, electro, Conn.	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00
Copper, Lake, delivered	30.125	30.125	30.125	30.125	30.125	30.125
Tin, Straits, New York	80.50	80.50	80.75	....	79.75	79.75*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.55	13.55

Note: Quotations are going prices.
*Tentative

MASTER ALLOYS and SPECIAL ALLOYS for STEEL MILL and FOUNDRY

Nickel Chrome 70/15 Ingot
Nickel Chrome 60/15 Ingot
Nickel Chrome 35/15 Ingot
Pure Copper Shot
Nickel Copper Shot 50/50
Nickel Copper Shot 70/30
60 Nickel 30 Copper
65 Nickel 30 Copper
Ferro-Nickel 50/50 Ingot and Shot
Chromium Copper 5%
Chromium Copper 10%
Copper Iron 70/30
Copper Iron 90/10
Copper Iron 95/5

ALTER COMPANY
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588

Nonferrous Prices

(Effective July 21, 1953)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136-in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢. 0.081-in. 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢. 0.032-in. 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5,

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32-in. 59.6¢ to 47.0¢; ⅜ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ½ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅝ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51	....	50.58
Copper, h-r	50.48	46.83	....
Copper, drawn	....	48.08	....
Low brass	45.99	45.68	....
Yellow brass	42.87	42.56	....
Red brass	47.11	46.80	....
Naval brass	47.01	41.07	42.33
Leaded brass	....	....	39.95
Com. bronze	48.76	48.45	....
Mang. bronze	50.73	44.62	46.18
Phos. bronze	70.50	70.75	....
Muntz metal	44.91	40.47	41.72
Ni silver, 10 pct	56.56	59.83	62.89

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.50-21.50
Aluminum pig	19.50-20.00
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	30.125
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.55
Lead, New York	13.75
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$190 to $193
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$93
Silver, New York, cents per oz.	85 25
Tin, New York	79.75
Titanium, sponge	$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.25-11.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	26.00
No. 120	25.00
No. 123	24.00
80-10-10 ingot	
No. 305	30.00
No. 315	28.00
88-10-2 ingot	
No. 210	38.25
No. 215	34.75
No. 245	30.25
Yellow ingot	
No. 405	21.25
Manganese bronze	
No. 421	26.50

Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	24.50-25.50
0.60 copper, max.	24.25-25.00
Piston alloys (No. 122 type)	22.75-23.50
No. 12 alum. (No. 2 grade)	22.00-23.00
108 alloy	22.75-23.50
195 alloy	23.00-25.00
13 alloy (0.60 copper max.)	24.50-25.00
ASX-679	22.50-23.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	23.75-24.00
Grade 2—92-95%	23.00
Grade 3—90-92%	22.00
Grade 4—85-90%	21.00-22.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28⅝	27⅝
Yellow brass	21½	19⅝
Red brass	25½	24⅝
Comm. bronze	26¼	25⅝
Mang. bronze	20	19¼
Brass rod ends	19¾	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	23½—24
No. 2 copper wire	22
Light copper	20½
*Refinery brass	19½—20

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	23½
Light copper	21
No. 1 composition	18½—18¾
No. 1 comp. turnings	18 —18¼
Rolled brass	14 —14½
Brass pipe	14 —14½
Radiators	14

Aluminum

Mixed old cast	14 —14½
Mixed new clips	14½—16
Mixed turnings, dry	14 —14½
Pots and pans	14 —14½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	23
No. 2 heavy copper and wire	20
Light copper	18
New type shell cuttings	18
Auto radiators (unsweated)	13
No. 1 composition	16½—17
No. 1 composition turnings	16 —16⅛
Unlined red car boxes	15 —16
Cocks and faucets	15
Mixed heavy yellow brass	11½
Old rolled brass	14
Brass pipe	16
New soft brass clippings	16½—17½
Brass rod ends	16 —16½
No. 1 brass rod turnings	15 —16

Aluminum

Alum. pistons and struts	7 — 7½
Aluminum crankcases	10
2S aluminum clippings	14
Old sheet and utensils	10
Borings and turnings	7½
Misc. cast aluminum	10
Dural clips (24S)	10

Zinc

New zinc clippings	5⅜
Old zinc	4½
Zinc routings	2½
Old die cast scrap	3½

Nickel and Monel

Pure nickel clippings	100
Clean nickel turnings	85
Nickel anodes	100
Nickel rod ends	100
New Monel clippings	33 —35
Clean Monel turnings	25
Old sheet Monel	30 —32
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12

Lead

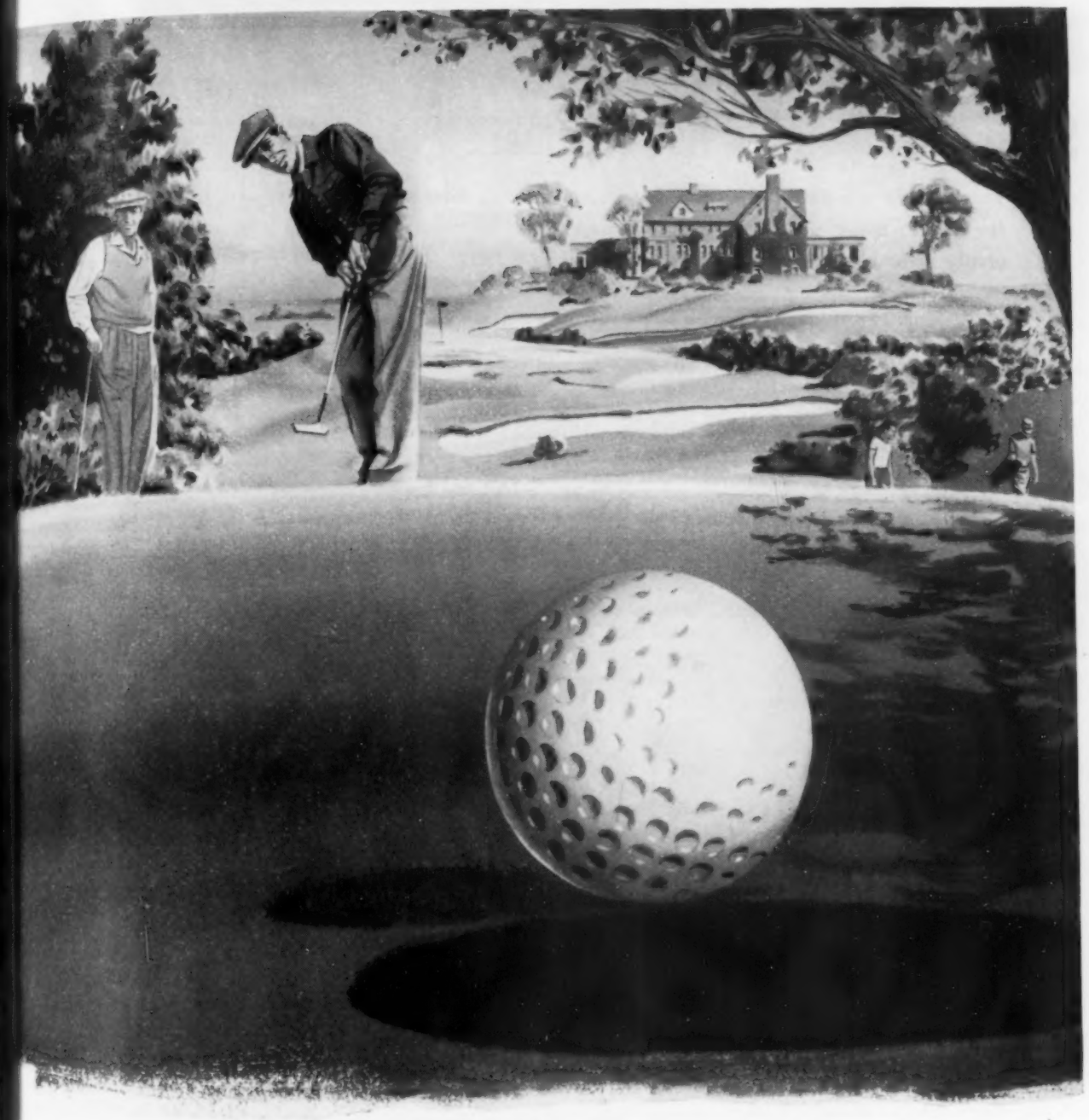
Soft scrap, lead	10½—11
Battery plates (dry)	6 — 6¼
Batteries, acid free	4.40— 4.50

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	70 —73
No. 1 pewter	47 —50
No. 1 auto babbitt	40
Mixed common babbitt	12 —12½
Solder joints	15
Siphon tops	40
Small foundry type	15
Monotype	14
Lino. and stereotype	12½
Electrotype	11
Hand picked type shells	8½
Lino. and stereo. dross	8
Electro dross	4½



PAR is just another habit!

When you keep your eye on the ball—and keep playing the game for all you're worth, day after day—you're pretty sure to be a better-than-average performer.

That's the way it goes in the brass mill business, too. And here at Bristol we are able to score consistently enough—both in production and service—so that quite a few of the country's top users of sheet, rod and wire have taken us on as their partner.

Care to shoot a "Practice round" with us some time?

THE
BRISTOL BRASS
CORPORATION

Makers of Brass since 1850 in Bristol, Connecticut.
Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

Scrap Gets Spotty in Hot Weather

Trading picture across the country is uneven . . . East waits for fall to bring significant price changes . . . Midwest generally optimistic with hefty boosts for some items.

Spotty was the word for the scrap market across the country this week. The East was generally quiet, with some small activity as brokers moved to cover commitments. Most felt prices would stay about where they are until late August, early September.

The situation in most areas of the Midwest was decidedly more bullish. No. 1 steel in St. Louis was up $1 to $2 per ton, while several items moved at increased prices. Windy City brokers are generally optimistic, were reported buying railroad grades above present mill levels. Cleveland and Cincinnati traders are generally keeping their necks in until the start of August buying.

Detroit scrap specialists were surprised again this week. They have been pretty conservative during the recent upward swing, were happy to be wrong again as most grades went up by at least $2.

West Coast business was solid if unspectacular. But dealers are starting to say that the present high western ingot rate can't be maintained into the fall without a hike in scrap prices. Collectors are grumbling it isn't worth the effort at current levels.

Pittsburgh — Scrap prices in this steelmaking area remained fairly stable this week. Shipments to one independent mill are reported good. Another large consumer reportedly won't come into the market in August. Dealers and brokers generally agree steelmaking grades have probably reached their peak. One broker says he is running out of orders. The turnings market seems slightly weaker. Low phos fell off $1 to $50 on the basis of sale.

Chicago—Some upward price revisions were registered here with No. 1 bundles, low phos, most turnings and some railroad grades pushing up $1. Brokers continue to be bullish and in some cases have bought railroad grades at higher prices than mills are paying. No. 2 bundles were off $2.

Philadelphia—Local scrap trade is very quiet this week with some slackening of demand for No. 2 bundles as one consumer dropped out of the market and another was restricting shipments. Recent snap in the market has wilted in the heat. No price changes were made this week except in unstripped motor blocks, which went up on the basis of a sale.

New York—Some dealers report a slightly freshening in business as brokers cover their commitments, but prices are practically unchanged. The trade generally expects present price levels to hold until last half August or early September, then rise. A sale brings shoveling turnings to $24.00 to $24.50.

Detroit—Increasing strength of the market continued to surprise the trade in Detroit. A pessimistic view has been taken throughout the recent upward price climb here. Prices being paid by Detroit consumers as well as outside mills established price levels by at least $2 up last week for most grades and even more for individual items.

Cleveland—There was no change in the premium grades following last week's limited activity. Some traders, who expect buying activity to pick up, believe prices will hold at current levels. Those who disagree report that some brokers are holding $49 railroad scrap with no takers in sight. Increased pig iron prices have hiked railroad cast, No. 1 machinery and malleable $1. Blast furnace grades were much stronger in the Youngstown area, went up $2 on the basis of a sale.

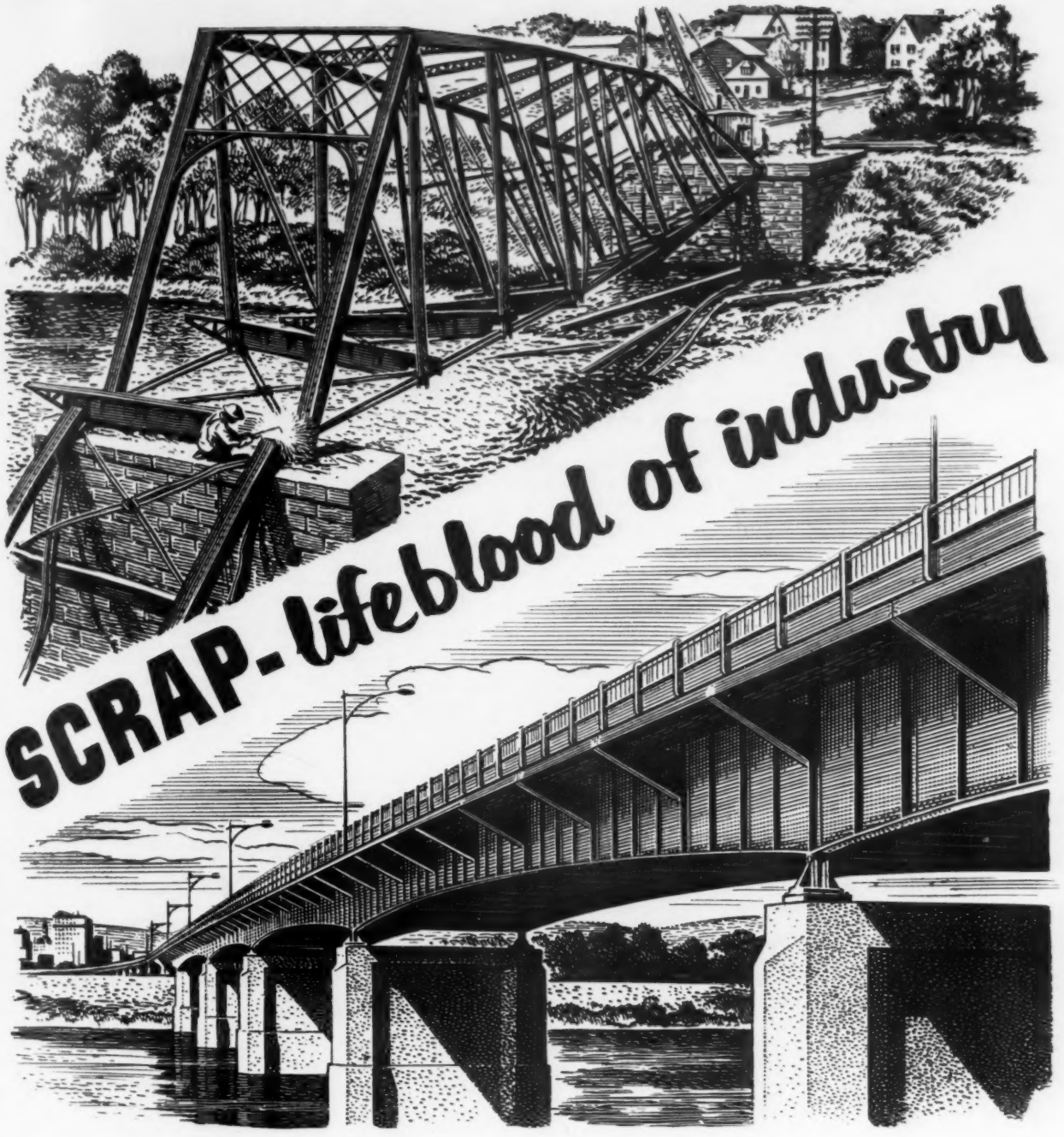
Birmingham—There have been no new purchases by local mills. Birmingham district openhearth shops have embargoed inbound shipments until further notice. Scrap not in the immediate vicinity of the city is moving north to stronger markets. Northern brokers still believe there is a reservoir of scrap in the South, but southern yards aren't receiving it. Cast demand is strong but with few sales because of low dealer stocks.

St. Louis — Industries supplying shoveling turnings are closed for vacation, and curtailment of production caused an increase of $3 a ton. Dealers' grades are strong despite a temporary lull in buying. Principal movement of the week came from railroads, but shipments from the country are light. No. 1 steel is $1 to $2 higher.

Cincinnati — Mills here still have comfortable inventories and scrap is moving freely. There was no price change for openhearth grades. Most dealers and brokers are marking time until August buying starts. Shoveling turnings went down another $1 to $27 as openhearth consumption slackened. Cast market remained firm.

Boston—Recent price hikes in steelmaking scrap have caught several local members of the trade unaware. Now they find themselves paying new prices for material they have to deliver on old contracts at lower prices. Jump in No. 2 steel this week was latest. More market action is expected now that plants are coming back into production after vacations.

West Coast—Dealers are currently shipping about as received and mills getting all necessary tonnage. Collectors, however, are becoming increasingly reluctant to operate at current prices. Dealers feel if western steel production, currently at one of highest ingot rates in country holds up, prices may go up in fall. No price changes last week.



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices

(Effective July 21, 1953)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$47.00	$48.00
No. 2 hvy. melting	43.00	44.00
No. 1 bundles	47.00	48.00
No. 2 bundles	41.00	42.00
Machine shop turn.	27.00	28.00
Mixed bor. and ms. turns.	27.00	28.00
Shoveling turnings	31.00	32.00
Cast iron borings	31.00	32.00
Low phos. punch'gs, plate	49.00	50.00
Heavy turnings	42.00	43.00
No. 1 RR. hvy. melting	48.00	49.00
Scrap rails, random lgth.	49.00	50.00
Rails 2 ft and under	54.00	55.00
RR. steel wheels	52.50	53.50
RR. spring steel	52.50	53.50
RR. couplers and knuckles	52.50	53.50
No. 1 machinery cast.	49.00	50.00
Cupola cast.	43.00	44.00
Heavy breakable cast.	41.00	42.00
Malleable	50.00	51.00

Chicago

No. 1 hvy. melting	$43.00	$44.00
No. 2 hvy. melting	38.00	39.00
No. 1 factory bundles	44.00	45.00
No. 1 dealers' bundles	43.00	44.00
No. 2 dealers' bundles	35.00	36.00
Machine shop turn.	22.00	24.00
Mixed bor. and turn.	26.00	27.00
Shoveling turnings	26.00	27.00
Cast iron borings	26.00	27.00
Low phos. forge crops	49.00	50.00
Low phos. punch'gs, plate	47.00	48.00
Low phos. 3 ft and under	46.00	48.00
No. 1 RR. hvy. melting	46.00	47.00
Scrap rails, random lgth.	49.00	51.00
Rerolling rails	56.00	57.00
Rails 2 ft and under	54.00	56.00
Locomotive tires, cut	49.00	50.00
Cut bolsters & side frames	48.00	49.00
Angles and splice bars	49.00	51.00
RR. steel car axles	54.00	55.00
RR. couplers and knuckles	50.00	51.00
No. 1 machinery cast.	45.00	46.00
Cupola cast.	42.00	43.00
Heavy breakable cast.	39.00	40.00
Cast iron brake shoes	37.00	38.00
Cast iron car wheels	43.00	44.00
Malleable	42.00	44.00
Stove plate	36.00	37.00

Philadelphia Area

No. 1 hvy. melting	$43.00	$44.00
No. 2 hvy. melting	39.00	40.00
No. 1 bundles	44.00	45.00
No. 2 bundles	33.50	34.50
Machine shop turn.	26.50	27.50
Mixed bor., short turn.	30.00	31.00
Shoveling turnings	31.00	32.00
Clean cast chem. borings.	38.50	39.00
Low phos. 5 ft and under	44.00	45.00
Low phos. 2 ft and under	46.00	47.00
Low phos. punchings	46.00	47.00
Elec. furnace bundles	45.00	46.00
Heavy turnings	42.00	43.00
RR. steel wheels	49.00	50.00
RR. spring steel	49.00	50.00
Rails 18 in. and under	55.00	56.00
Cupola cast.	38.00	39.00
Heavy breakable cast.	41.00	42.00
Cast iron carwheels	46.00	47.00
Malleable	46.00	47.00
Unstripped motor blocks.	31.00	32.00
No. 1 machinery cast.	45.00	46.00
Charging box cast.	39.00	40.00

Cleveland

No. 1 hvy. melting	$45.00	$46.00
No. 2 hvy. melting	41.00	42.00
No. 1 bundles	45.00	46.00
No. 2 bundles	39.00	40.00
No. 1 busheling	45.00	46.00
Machine shop turn.	24.00	25.00
Mixed bor. and turn.	28.00	29.00
Shoveling turnings	28.00	29.00
Cast iron borings	28.00	29.00
Low phos. 2 ft and under	46.00	47.00
Drop forge flashings	45.00	46.00
No. 1 RR. hvy. melting	47.00	48.00
Rails 3 ft and under	54.00	55.00
Rails 18 in. and under	56.00	57.00
Railroad grate bars	40.00	41.00
Steel axle turnings	38.00	39.00
Railroad cast	49.00	50.00
No. 1 machinery cast.	50.00	51.00
Stove plate	44.00	45.00
Malleable	50.00	51.00

Youngstown

No. 1 hvy. melting	$45.00	$46.00
No. 2 hvy. melting	42.00	43.00
No. 1 bundles	45.00	46.00
No. 2 bundles	40.00	41.00
Machine shop turn.	29.00	30.00
Shoveling turnings	33.00	34.00
Cast iron borings	33.00	34.00
Low phos. plate	48.00	49.00

Buffalo

No. 1 hvy. melting	$43.00	$44.00
No. 2 hvy. melting	40.00	40.50
No. 1 busheling	43.00	44.00
No. 1 bundles	43.00	44.00
No. 2 bundles	38.00	38.50
Machine shop turn.	26.00	27.00
Mixed bor. and turn.	31.00	31.50
Shoveling turnings	32.00	32.50
Cast iron borings	31.00	31.50
Low phos. plate	47.00	48.00
Scrap rails, random lgth.	47.00	48.00
Rails 2 ft and under	53.00	54.00
RR. steel wheels	53.00	53.50
RR. spring steel	53.00	53.50
RR. couplers and knuckles	53.00	53.50
No. 1 machinery cast.	44.00	45.00
No. 1 cupola cast.	40.00	41.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.00	$39.00
No. 2 hvy. melting	34.00	35.00
No. 1 bundles, openhearth	40.00	41.00
No. 2 bundles	32.00	33.00
New busheling	36.00	37.00
Drop forge flashings	36.00	37.00
Machine shop turn.	20.00	21.00
Mixed bor. and turn.	23.00	24.00
Shoveling turnings	23.00	24.00
Cast iron borings	23.00	24.00
Electric furnace, bundles	40.00	41.00
Low phos. punch'gs, plate	39.00	40.00
No. 1 cupola cast		43.00
Heavy breakable cast.		34.00
Stove plate		38.00
Automotive cast.		43.00

St. Louis

No. 1 hvy. melting	$45.00	$46.00
No. 2 hvy. melting	37.00	38.00
No. 2 bundled sheets	34.00	35.00
Machine shop turn.	17.00	19.00
Shoveling turnings	20.00	22.00
Cast iron borings	15.00	16.00
Rails, random lengths	48.00	50.00
Rails 18 in. and under	53.00	55.00
Locomotive tires, uncut	44.00	46.00
Angles and splice bars	47.00	48.00
Std. steel car axles	53.00	54.00
RR. spring steel	49.00	50.00
Cupola cast.	41.00	42.00
Hvy. breakable cast.	37.00	38.00
Cast iron brake shoes	40.00	41.00
Stove plate	36.00	37.00
Cast iron car wheels	43.00	44.00
Malleable	42.00	43.00
Unstripped motor blocks.	37.00	38.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.50	$37.50
No. 2 hvy. melting	30.00	31.00
No. 2 bundles	28.00	29.00
Low phos. 2 ft and less.	39.50	40.50
Machine shop turn.		20.00
Mixed bor. and turn		20.00
Shoveling turnings	24.00	24.50
Clean cast chem. borings	29.00	30.00
No. 1 machinery cast.	41.00	42.00
Mixed yard cast.	33.00	34.00
Charging box cast.	34.00	35.00
Heavy breakable cast.	34.00	35.00
Unstripped motor blocks.	22.00	23.00

Birmingham

No. 1 hvy. melting	$33.00	$34.00
No. 2 hvy. melting	31.00	32.00
No. 1 bundles	33.00	34.00
No. 2 bundles	29.00	30.00
No. 1 busheling	29.50	30.50
Machine shop turn.	23.00	23.50
Shoveling turnings	24.00	25.00
Cast iron borings	24.00	25.00
Electric furnace bundles	32.00	33.00
Bar crops and plate	39.00	40.00
Structural and plate, 2 ft.	36.00	37.00
No. 1 RR. hvy. melting	35.00	36.00
Scrap rails, random lgth.	41.00	42.00
Rerolling rails	46.00	47.00
Rails, 18 in. and under	45.00	46.00
Angles & splice bars	45.00	46.00
Std. steel axles	45.00	46.00
No. 1 cupola cast.	43.00	44.00
Stove plate	40.00	41.00
Cast iron car wheels	46.00	47.00
Charging box cast.	30.00	31.00
Heavy breakable	30.00	31.00
Unstripped motor blocks.	32.00	33.00
Mashed tin cans	17.00	18.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00	$34.00
No. 2 hvy. melting	30.00	31.00
No. 1 bundles	32.50	33.00
No. 2 bundles	28.00	29.00
No. 1 busheling	32.50	33.00
Elec. furnace, 3 ft & under	34.00	35.00
Machine shop turn.	17.50	18.50
Mixer bor. and short turn.		21.00
Shoveling turnings	21.00	21.50
Clean cast chem. borings.		28.17
No. 1 machinery cast	30.00	31.00
Mixed cupola cast.	26.00	28.00
Heavy breakable cast.	28.00	30.00
Stove plate		27.00
Unstripped motor blocks.		22.00

Cincinnati

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00	$43.00
No. 2 hvy. melting	38.00	39.00
No. 1 bundles	42.00	43.00
No. 2 bundles	36.00	37.00
Machine shop turn.	21.00	22.00
Mixed bor. and turn.	25.00	26.00
Shoveling turnings	26.00	27.00
Cast iron borings	25.00	26.00
Low phos. 18 in. & under	46.00	47.00
Rails, random lengths	46.00	47.00
Rails, 18 in. and under	53.00	54.00
No. 1 cupola cast.	42.00	43.00
Hvy. breakable cast.	37.00	38.00
Drop broken cast.	48.00	49.00

San Francisco

No. 1 hvy. melting		$28.00
No. 2 hvy. melting		24.00
No. 1 bundles		25.00
No. 2 bundles		22.00
No. 3 bundles		18.00
Machine shop turn.		10.00
Cast iron borings		15.00
No. 1 RR. hvy. melting		28.00
No. 1 cupola cast.	$38.00	39.00

Los Angeles

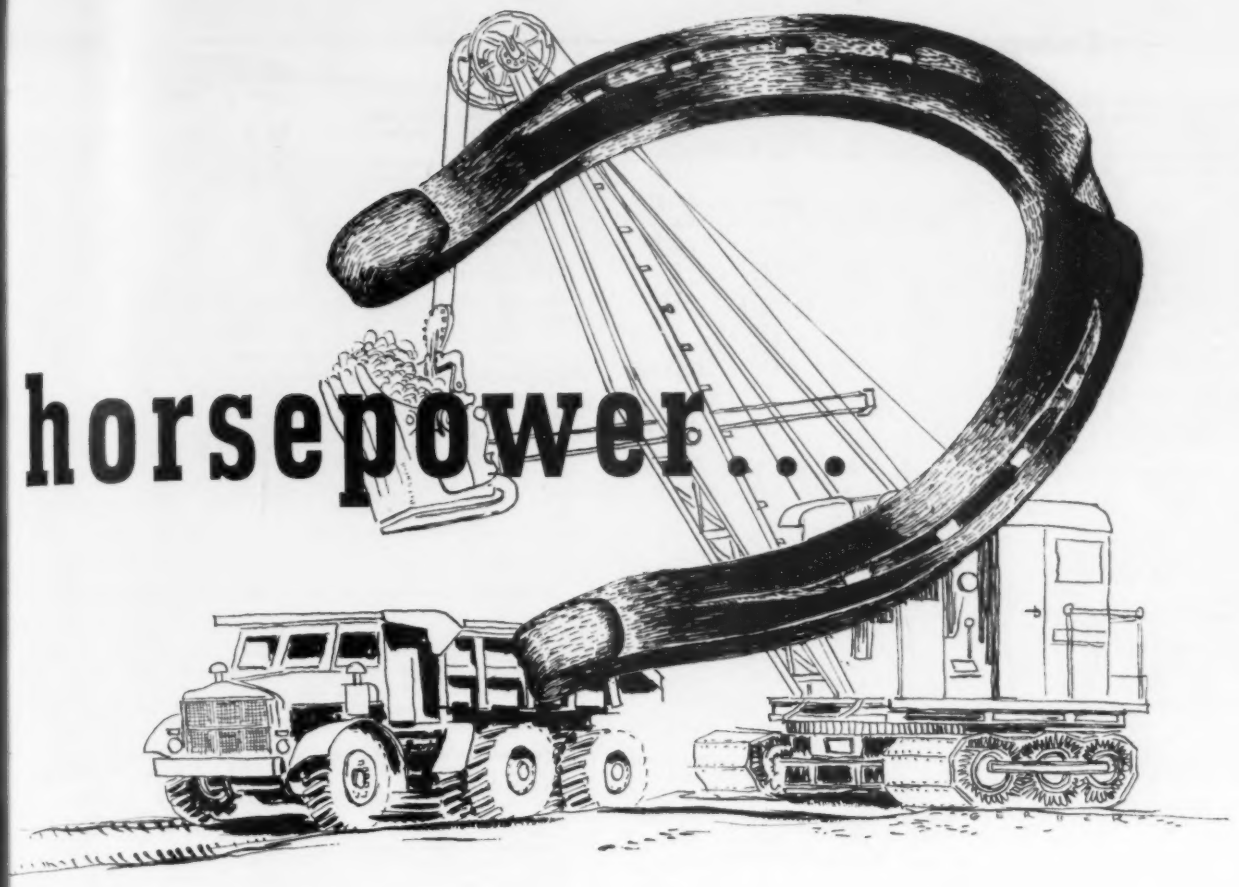
No. 1 hvy. melting		$24.00
No. 2 hvy. melting		20.00
No. 1 bundles		23.00
No. 2 bundles		20.00
No. 3 bundles		16.00
Mach. shop turn.		8.00
Shoveling turnings		12.00
Cast iron borings		13.00
Elec. fur. 1 ft and under		19.00
No. 1 RR. hvy. melting		24.00
No. 1 cupola cast.	$36.00	38.00

Seattle

No. 1 hvy. melting		$31.00
No. 2 hvy. melting		27.00
No. 1 bundles		28.00
No. 2 bundles		23.00
No. 1 cupola cast.		37.00
Mixed yard cast.		35.00

Hamilton Ont.

No. 1 hvy. melting		$32.00
No. 1 bundles		32.50
No. 2 bundles		32.00
Mechanical bundles		30.50
Mixed steel scrap		28.50
Bushelings		27.50
Bush., new fact. prep'd.		30.50
Bush., new fact. unprep'd.		28.50
Short steel turnings		26.50
Mixed bor. and turn.		26.50
Rails, remelting		33.50
Rails, rerolling		41.00
Cast scrap		50.00



horsepower...

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Comparison of Prices

(Effective July 21, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	July 21 1953	July 14 1953	June 23 1953	July 22 1952
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.60¢
Cold-rolled sheets	4.775	4.775	4.775	4.35
Galvanized sheets (10 ga)	5.275	5.275	5.275	4.80
Hot-rolled strip	3.925	3.925	3.925	3.60
Cold-rolled strip	5.575	5.575	5.575	4.75
Plate	4.10	4.10	4.10	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	36.75
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and Shapes: (per pound)				
Merchant bars	4.15¢	4.15¢	4.15¢	3.70¢
Cold finished bars	5.20	5.20	5.20	4.55
Alloy bars	4.875	4.875	4.875	4.30
Structural shapes	4.10	4.10	4.10	3.65
Stainless bars (No. 302)	35.50	35.50	35.50	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	4.85¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$3.60
Light rails	5.20	5.20	5.20	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$56.00
Slabs, rerolling	62.00	62.00	62.00	56.00
Forging billets	75.50	75.50	75.50	66.00
Alloy blooms, billets, slabs	82.00	82.00	82.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.10¢
Skelp	3.75	3.75	3.75	3.35
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.131¢

	July 21 1953	July 14 1953	June 23 1953	July 22 1952
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$62.19	$62.19	$60.69	$53.19
Foundry, Valley	56.50	56.50	55.00	52.50
Foundry, Southern, Cin'ti	60.43	60.43	58.93	55.43
Foundry, Birmingham	52.88	52.88	51.38	48.88
Foundry, Chicago†	56.50	56.50	55.00	52.50
Basic del'd Philadelphia	61.27	61.27	59.77	57.27
Basic, Valley furnace	56.00	56.00	54.50	52.00
Malleable, Chicago†	56.50	56.50	55.00	52.50
Malleable, Valley	56.50	56.50	55.00	52.50
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	8.00¢

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis.

Pig Iron Composite: (per gross ton)				
Pig iron	$56.76	$56.76	$55.26	$52.77
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$47.50	$47.50	$43.50	$41.75
No. 1 steel, Phila. area	43.50	43.50	42.50	40.50
No. 1 steel, Chicago	43.50	43.50	40.50	40.00
No. 1 bundles, Detroit	40.50	38.50	37.50	41.13*
Low phos., Youngstown	48.50	48.50	46.50	48.50*
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.00
No. 1 mach'y cast, Philadel'a	45.50	45.50	45.50	47.00
No. 1 mach'y cast, Chicago	45.50	45.50	43.50	40.50

* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$44.83	$44.83	$42.17	$40.75
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.875‡	29.875‡	29.875‡	24.50
Copper, Lake, Conn.	30.125	30.125	....	24.625
Tin, Straits, New York	79.75†	81.00*	93.875	$1.21¼
Zinc, East St. Louis	11.00	11.00	11.00	15.00
Lead, St. Louis	13.55	13.30	13.30	15.80
Aluminum, virgin ingot	21.00‡	20.50	20.50	19.00
Nickel, electrolytic	68.08	68.08	68.08	69.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips,

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	.....	.....
Everett *M6*	.....	63.25	63.75	57.00	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	56.50	57.00	61.00
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	56.00	56.50	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	60.00	60.50	61.00	61.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	56.00	56.50	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1, G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEELS

Base price cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50–46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25–37.50	37.50	39.75	39.75	59.00	45.75–46.00	51.25	30.00	30.50–31.00	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25–38.50	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa. *W2;* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¾¢); Butler, Pa., *A7;* Wallingford, Conn., *W1.*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft. Wayne, *J4.*

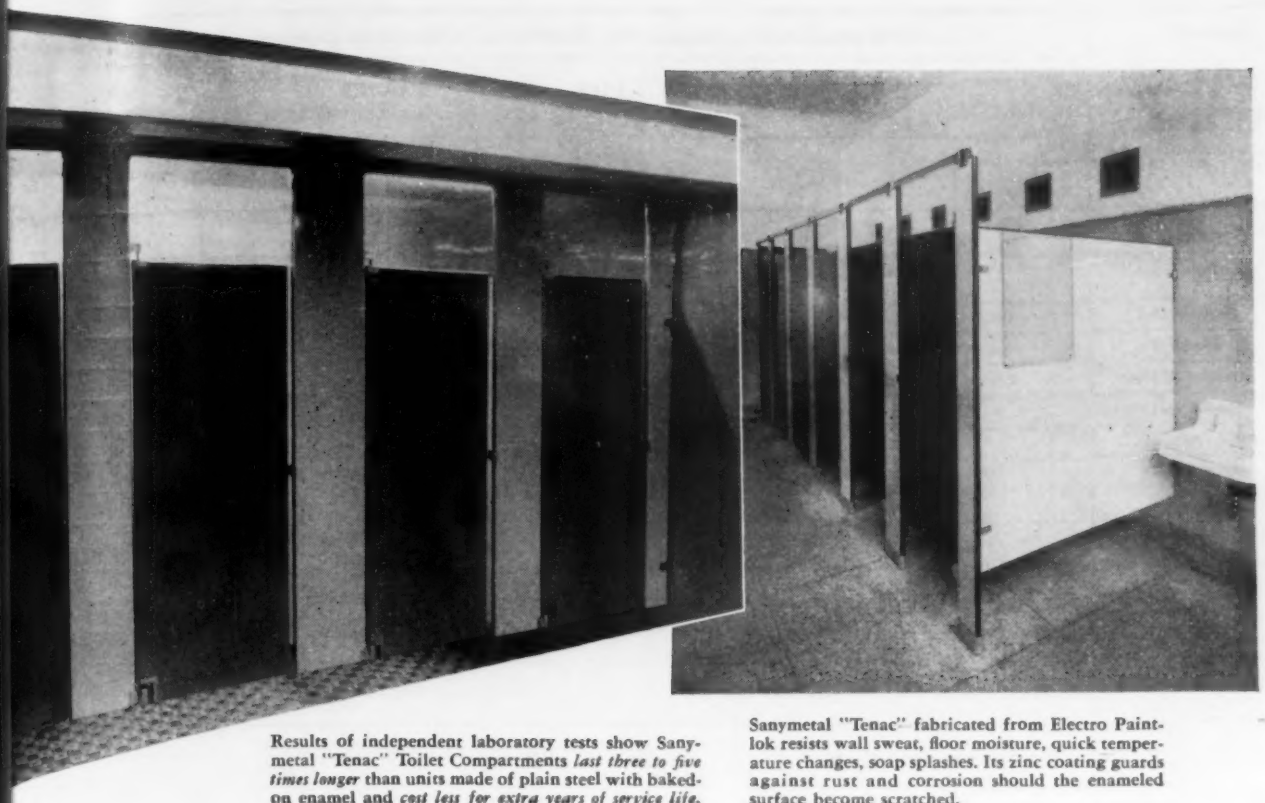
Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1,* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*



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Sanymetal "Tenac" fabricated from Electro Paintlok resists wall sweat, floor moisture, quick temperature changes, soap splashes. Its zinc coating guards against rust and corrosion should the enameled surface become scratched.

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Electro Paintlok . . . the zinc-plated steel sheet that is chemically treated to take and hold paint, lacquer and synthetic enamel . . . affords this manufacturer a number of fabricating advantages! Absolutely no fracturing when bending or rolling. No cracking, peeling or flaking of the zinc coating during punching and shearing operations. Edges do not rust while Electro Paintlok is in stock.

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IRON AGE

STEEL PRICES

(Effective July 21, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Buffalo, N. Y.			$62.00 *B3*	$75.50 *B3*, *R3*	$82.00 *B3*		4.925 *B3*	4.15 *B3*	6.20 *B3*	3.925 *B3*, *R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.										4.325 *A2*		6.20 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$62.00 *B3*	$75.50 *B3*	$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Newark, N. J.													
	New Haven, Conn.											5.95 *A5* 6.20 *D1*		
	Phoenixville, Pa.													
	Putnam, Conn.													
	Sparrows Pt., Md.										3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Worcester, Mass.													
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.													
	Ashland, Ky.										3.925 *A7*			
	Canton-Massillon, Ohio				$75.50 *R3*									
	Chicago, Ill.			$62.00 *U1*	$75.50 *R3*, *U1*, *W8*	$82.00 *U1*, *W8*, *R3*		4.925 *U1*	4.10 *U1*, *W8*	6.175 *U1*	3.925 *A1*, *W8*	5.95 *A1*	5.95 *R3*	
	Sterling, Ill.													
	Cleveland, Ohio				$75.50 *R3*							5.45 *A5*, *J3*		7.80 *J3*
	Detroit, Mich.		$63.00 *R5*		$78.50 *R5*	$85.00 *R5*					4.225 *G3* 4.40 *M2*	5.65 *G3*, *M2* 5.95 *D1* 6.05 *D2*	6.50 *G3*	7.90 *D2* 8.50 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$62.00 *U1*	$75.50 *U1*	$82.00 *U1*, *Y1*		4.925 *I3*	4.10 *I3*, *U1*	6.175 *U1*, *I3*	3.925 *I3*, *U1*, *Y1*	5.70 *I3*	5.95 *U1*, *I3* 6.45 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.45 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.80 *S1*	5.95 *S1*	7.65 *S1*
	Pittsburgh, Pa. Midland, Pa.	$59.00 *U1*	$62.00 *U1*	$62.00 *U1* $62.50 *J3*	$75.50 *J3*, *U1*	$82.00 *U1*	3.75 *U1* 3.85 *J3*	4.925 *U1*	4.10 *J3*, *U1*	6.175 *J3*, *U1*	4.425 *S7*, *S9*	5.45 *B4*, *J3* 6.15 *S7*		7.80 *J3*
	Portsmouth Ohio													
	Weirton, Wheeling Follansbee, W. Va.								4.35 *W3*		4.025 *W3*	5.45 *F3*, *W3*	6.30 *W3*	
	Youngstown, Ohio					$82.00 *Y1*	3.75 *R3*, *U1*		4.10 *Y1*		3.925 *R3*, *U1*, *Y1*	5.45 *R3*, *Y1*	5.95 *U1* 6.45 *Y1*	8.30 *Y1*
WEST	Fontana, Cal.	$86.00 *K1*	$88.00 *K1*	$81.00 *K1*	$94.50 *K1*	$101.00 *K1*			4.75 *K1*	6.825 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*	
	Geneva, Utah				$75.50 *C7*				4.10 *C7*	6.175 *C7*				
	Kansas City, Mo.								4.80 *S2*	6.875 *S2*	4.625 *S2*		6.65 *S2*	
	Los Angeles, Torrance, Cal.				$94.50 *B2*	$102.00 *B2*			4.80 *B2*, *C7*	6.85 *B2*	4.675 *B2*, *C7*			
	Minnequa, Colo.													
	San Francisco, Niles, Pittsburg, Cal.				$94.50 *B2*				4.75 *B2* 4.91 *P9*	6.80 *B2*	4.675 *B2*, *C7*			
	Seattle, Wash.				$94.50 *B2*, *S11*				4.85 *B2*	6.90 *B2*				
SOUTH	Atlanta, Ga.										4.475 *A8*			
	Fairfield, Ala. Alabama City, Ala.			$62.00 *T2*	$75.50 *T2*				4.10 *R3*, *T2*	6.175 *T2*	3.925 *R3*, *T2*		5.95 *T2*	
	Houston, Texas				$85.50 *S2*	$92.00 *S2*			4.60 *S2*		4.425 *S2*			

PRICES STEEL

(Effective July 21, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*				Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Clayment, Del.
													Coatesville, Pa.
4.125 *A2*					6.15 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.525 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
4.025 *U1*	4.875 *U1*									$8.80 *U1*	$7.50 *U1*	6.60 *U1*	Morrisville, Pa.
3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.825 *A5*				Worcester, Mass.
													Trenton, N. J.
													Alton, Ill.
3.925 *A7*		5.275 *A7*	5.175 *A7*										Ashland, Ky.
		5.275 *R3*											Canton-Massillon, Ohio
3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4*				Chicago, Ill.
									4.625 *N4*				Sterling, Ill.
3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3*	7.225 *J3*			4.525 *A5*				Cleveland, Ohio
4.125 *G3*	4.975 *G3*				6.375 *G3*	7.675 *G3*							Detroit, Mich.
													Duluth, Minn.
3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1* 5.325 *I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
		5.475 *G2*	5.875 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.375 *C9*											Kokomo, Ind.
	4.775 *A7*		5.175 *A7*	5.675 *A7*									Middletown, Ohio
4.225 *S1*				5.45 *S1*	5.90 *S1*						$7.40 *R3*		Niles Ohio Sharon, Pa.
3.925 *J3, U1, P6*	4.775 *J3, U1*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*	Pittsburgh Pa. Midland, Pa.
	5.775 *D1*							4.725 *D1*					Portsmouth, Ohio
3.925 *W3, W5*	4.775 *W3, W5*	5.275 *W3, W5*		5.675 *W3, W5*		7.475 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.55 *W5*	Weirton, Wheeling, Follansbee, W. Va.
3.925 *R3, U1, Y1*	4.775 *R3, Y1*				5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.70 *K1*	5.875 *K1*				7.00 *K1*	8.275 *K1*			5.325 *K1*				Fontana, Cal.
4.025 *C7*													Geneva, Utah
									4.865 *S2*				Kansas City, Mo.
4.625 *C7*		6.025 *C7*						5.325 *B2*					Los Angeles, Torrance, Cal.
													Minnequa, Colo.
4.625 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2*	4.525 *T2*	$8.80 *T2*	$7.50 *T2*		Fairfield Ala. Alabama City, Ala.
3.425 *S2*									4.925 *S2*				Houston, Texas

IRON AGE

STEEL PRICES

(Effective July 21, 1958)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.275 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3,R3*	4.15 *B3*	5.25 *B5*	4.875 *B3,R3*	6.275 *B3* 6.325 *B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.											
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken, Pa.							4.55 *A2*	5.15 *A2*		6.50 *A2*	
	Harrisburg, Pa.											
	Hartford, Conn.			5.85 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Newark, N. J.			5.70 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.					6.50 *P10*						
	Putnam, Conn.			5.85 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5*		6.775 *B5*						5.825 *A5, W6*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio	4.15 *R3*		5.20 *R2,R3*	4.875 *R3*	6.325 *R2,R3*						
	Chicago, Ill.	4.15 *R3, U1, W8*	4.15 *R3* 4.90 *N4*	5.20 *A5,W10, W8,B5* 5.90 *L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10,L2,R3, B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A5, R3,N4* 5.625 *W7*
	Cleveland, Ohio	4.15 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5,C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5* 4.50 *G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	5.025 *R5* 5.225 *G3*	6.475 *R5,P8* 6.525 *B5,P3*	6.875 *G3*	4.65 *G3*			7.10 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary Ind. Harbor Crawfordsville, Indiana	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.											
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.75 *N4*	5.00 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.70 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5, J3, W10,R3*	4.875 *U1*	6.325 *A5, W10*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5,J3, P6*
	Portsmouth, Ohio											5.725 *D1*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.40 *W3*				
	Youngstown, Ohio	4.15 *R3, U1, Y1*	4.15 *R3, U1, Y1*	5.20 *Y1*	4.875 *U1, Y1*		6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Genoa, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.85 *S2*	4.85 *S2*		5.575 *S2*		6.925 *S2*					
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					
	Minnequa, Colo.											
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2*	4.90 *B2,S11*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.45 *A8*	4.45 *A8*									5.775 *A8*
	Fairfield, Ala. Alabama City, Ala.	4.15 *R3,T2*	4.15 *R3,T2*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Texas Ft. Worth, Texas	4.65 *S2*	4.65 *S2*		5.375 *S2*			4.60 *S2*				

Steel Prices

(Effective July 21, 1953)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	32.25	15.5	31.75	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*																						
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*																						
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 11.0¢.

Steel Prices

(Effective July 21, 1953)

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*32.7	
Washington, Pa. *J2*	....	
Claymont, Del. *C4*	....	
New Castle, Ind. *I2*	....	
Nickel-carbon		
10 pct. Coatesville, Pa. *L4*	37.5	
Inconel-carbon		
10 pct. Coatesville, Pa. *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa. *L4*	38.90	
No. 302 Stainless copper stainless, Carnegie, Pa. *A4*		....
Aluminized steel sheets, hot dip, Butler, Pa., *A7*		....

* Includes annealing and pickling, sandblasting.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $110.30 to $113.80
6 to 24-in., del'd N.Y. 113.50 to 114.50
6 to 24-in. Birmington. 96.50 to 101.00
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less .....$128.00 to $130.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	7.85	8.35	9.60	10.40	10.95	11.50	12.20
Brackenridge *A5*	7.85	8.35	9.60	10.40	10.95	.....	12.20
Granite City *G2*	.....	.....	.....	.....	.....	.....	.....
Ind. Harbor *I3*	7.85	8.35	9.60	.....	.....	.....	.....
Mansfield *E2*	.....	.....	.....	.....	.....	.....	.....
Newport, Ky. *N5*	7.85	8.35	9.60	10.40	10.95	.....	.....
Niles, O. *N3*	7.85	8.35	.....	.....	.....	.....	.....
Vandergrift *U1*	7.85	8.35	9.60	10.40	10.95	11.50	12.20
Warren, O. *R3*	7.85	8.35	9.60	.....	.....	.....	.....
Zanesville *A7*	7.85	8.35	9.60	10.40	10.95	11.50	12.20

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As Rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.20	7.64	7.81[3]	7.00	.....	6.85	6.98	6.86	7.92	.....	.....	.....	.....
Birmingham	.15	6.10	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.90	.....	.....	.....	.....
Boston	.20	6.89	7.83	9.23	7.13	9.23–9.35[2]	7.13	7.06	6.87	8.10	12.40	12.25–12.28	.....	14.75–14.78
Buffalo	.20	6.18–6.20	7.15	9.00–9.01	6.65–6.79	.....	6.65–6.68	6.55–6.59	6.35–6.65	7.45	.....	12.17–15.35	14.45	14.55
Chicago	.20	6.18	7.12	8.05	6.42	.....	6.33–6.38	6.46	6.28	7.30	.....	11.75	.....	14.25
Cincinnati	.20	6.46	7.14	8.42	6.67	.....	6.80	6.88	6.53	7.61	.....	12.12	.....	14.52
Cleveland	.20	6.18	7.12	7.90	6.58	.....	6.50	6.79	6.34	7.40	.....	11.89	.....	14.39
Denver		7.95	8.85	10.10	8.20	9.55	7.95	7.95	8.05	9.05	.....	.....	.....	15.25–15.75
Detroit	.20	6.35–6.45	7.25–7.32	8.34	6.30–7.31	7.36–8.35	6.53–6.85	6.93	6.56–6.57	7.60–7.69	12.27	12.12	14.52	13.44–14.62
Houston	.20	7.15	7.85	.....	7.45	.....	7.20	7.35	7.45	9.85	.....	12.95	.....	.....
Kansas City	.20	6.85	7.79	8.72	7.09	.....	7.05	7.13	6.95	8.08	.....	.....	.....	.....
Los Angeles	.20	7.25	9.00	9.60	7.55	10.75–11.30	7.20	7.35	7.15–7.25	9.40–9.75	13.40–13.55	13.05	15.75	15.85–16.05
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	7.89	.....	.....	.....	.....
Milwaukee	.20	6.35	7.29	8.22	6.59	.....	6.50–6.55	6.63	6.45	7.57	.....	11.92	.....	14.42
New Orleans	.15	6.51–6.66	7.56	8.25	6.63–6.78	.....	6.73–6.88	6.81–6.96	6.60–6.75	8.42–8.57	.....	.....	.....	.....
New York	.30	6.78	7.75	9.02	7.16	9.05	6.99	6.90	7.06	7.90–8.18	11.99–12.29	10.39–12.14	14.04–14.54	12.64–14.64
Norfolk	.20	6.90	.....	.....	7.20	.....	7.15	7.20	7.20	8.50	.....	.....	.....	.....
Philadelphia	.25	6.53	7.55–8.25	8.35	7.02	.....	6.63	6.67	6.87	7.94	12.04	11.89	14.29	14.39
Pittsburgh	.20	5.95–6.18	6.82	8.30–8.60	6.20–6.55	.....	6.03–6.33	6.07–6.46	5.98–6.28	7.12–7.40	.....	11.45–11.75	.....	13.75–14.25
Portland	.10	8.00	9.80	9.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake City	.20	9.05	10.80	10.65	9.35	.....	8.70	8.85	9.20	11.25	.....	.....	.....	.....
San Francisco	.15	7.35	8.70	9.90–10.15	7.60	10.35	7.20	7.25	7.15	9.75–9.85	13.55	12.80–13.05	15.50	15.55–16.05
Seattle	.20	7.95	8.50	9.90	7.82	.....	7.39	7.30	7.38	9.93	.....	13.30	.....	15.80
St. Louis	.20	6.48	7.42	8.35	6.72	.....	6.73	6.86	6.58	7.70	12.20	12.05	14.45	14.30–14.55
St. Paul	.15	6.84	7.78	8.71	7.08	.....	6.99	7.12	6.94	8.06	.....	12.19	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb. (4)500 to 9999 lb.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Twisted Barbless Wire Col	Galv. Barbed Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
Alabama City *R3*	131	140	...	149	..	153	6.675	7.07
Aliquippa, Pa. *J3*	...	...	...	...	...	...	...	...
Atlanta *A8*	...	...	...	...	...	...	...	...
Bartonville *K2*	...	...	...	...	...	...	...	...
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago, Ill. *N4*	131	143	...	149	156	156	6.675	7.225
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.675	...
Crawfrdsvl. *M4*	133	145	...	151	..	153	6.775	7.325
Donora, Pa. *A5*	131	140	...	149	..	153	6.675	7.075
Duluth *A5*	131	140	145	149	..	153	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	..	153	6.675	7.075
Galveston *D4*	139	...	...	...	...	...	...	...
Houston *S2*	...	...	...	...	...	...	...	...
Johnstn., Pa. *B3*	131	143	...	...	156	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	..	153	6.675	7.075
Kokomo, Ind. *C9*	133	142	...	151	..	155	6.775	7.175
Los Angeles *B2*	...	...	...	...	...	...	...	...
Kansas City *S2*	...	...	...	...	...	...	...	...
Minnequa *C6*	...	...	...	...	...	...	...	...
Monessen *P6*	131	...	...	...	...	...	6.675	7.225
Moline, Ill. *R3*	...	...	140	...	...	...	...	...
Pittsburg, Cal. *C7*	150	163	...	173	173	173	7.625	8.025
Portsmouth *P7*	...	...	...	...	...	...	...	...
Rankin, Pa. *A5*	131	140	...	...	..	153	6.675	7.075
So. Chicago *R3*	131	140	140	149	..	153	6.675	7.075
S. San Fran. *C6*	...	...	...	...	...	...	...	...
Sparrows Pt. *B3*	133	...	...	151	158	158	6.775	7.325
Struthers, O. *Y1*	...	...	...	...	...	...	...	...
Worcester *A5*	137	...	...	...	...	...	6.975	...
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*).

* Alabama City and So. Chicago don't include zinc extra Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	6.15	8.00	8.60	10.55	12.85
Carnegie, Pa. *S9*	.....	8.00	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D2*	6.05	8.25	8.85	.....	.....
New Castle, Pa. *B4*	5.80	8.00	8.60	.....	.....
New Haven, Conn. *D1*	.....	.....	.....	.....	.....
Sharon, Pa. *S1*	5.80	8.00	8.60	10.55	12.85
Trenton *R4*	.....	7.95	8.55	10.50	12.80
Weirton, W. Va. *W3*	5.80	8.00	8.60	10.55	12.85
Worcester, Mass. *A5*	5.75	7.95	8.90	10.85	13.15
Youngstown *C5*	.....	.....	.....	.....	.....

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.08	36.28	26.51	31.98
	2½	12	40.51	48.86	35.70	43.07
	3	12	45.92	55.39	.....	49.73
	3½	11	53.60	64.65	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National Tube	2	13	.....	32.98	24.88	.....
	2½	12	36.82	44.41	33.50	.....
	3	12	42.52	51.28	38.69	.....
	3½	11	49.63	59.87	45.16	.....
	4	10	65.91	79.50	59.97	.....
Pittsburgh Steel	2	13	27.34	32.98	.....	.....
	2½	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3½	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

Miscellaneous Prices

(Effective July 21, 1953)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.325	5.20	5.275	....	....	.....	.....
Chicago *R3*	.....	.....	.....	7.05	....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	....	.....	.....
Ensley *T2*	4.325	5.20	.....	.....	....	.....	.....
Fairfield *T2*	.....	5.20	.....	.....	....	5.125	.....
Gary *U1*	4.325	5.20	.....	.....	....	5.125	.....
Ind. Harbor *I3*	4.325	.....	5.275	7.05	....	5.125	.....
Johnstown *B3*	.....	5.20	.....	.....	....	.....	.....
Joliet *U1*	.....	5.20	5.275	.....	....	.....	.....
Kansas City *S2*	.....	.....	.....	.....	....	.....	.....
Lackawanna *B3*	4.325	5.20	5.275	.....	....	5.125	.....
Lebanon *B3*	.....	.....	.....	7.05	10.50	.....	11.00
Minnequa *C6*	.....	.....	.....	.....	....	.....	.....
Pittsburgh *R3*	.....	.....	.....	.....	....	.....	.....
Pittsburgh *O1*	.....	.....	.....	.....	....	.....	.....
Pittsburgh *P5*	.....	.....	.....	.....	....	.....	.....
Pittsburgh *J3*	.....	.....	.....	7.05	....	.....	.....
Pitt'g, Cal. *C7*	.....	.....	.....	.....	....	5.275	.....
Seattle *B2*	.....	.....	.....	.....	....	5.275	.....
Steelton *B3*	4.325	.....	5.275	.....	....	5.125	.....
Struthers *Y1*	.....	.....	.....	.....	....	.....	.....
Torrance *C7*	.....	.....	.....	.....	....	5.275	.....
Youngstown *R3*	.....	.....	.....	.....	....	.....	.....

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953 to end of season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	...

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	$14.50 to $15.00
Foundry beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	28.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. In in.	Length in in.	Cents Per lb.
	GRAPHITE	
24	84	20.50
18, 20	72	20.00
12, 14	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.50
2½	30	28.00
2	24	43.50
	CARBON	
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	+2	15	+2	18
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger.	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	18	+20	net
¾ in. to 1½ in. inclusive	+6	12	+25	+4
1⅝ in. & larger.	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	9
1⅝ in. & larger	+16	3	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	23	+8	10
1⅝ in. & larger.	+14	5	+20	net

	Light	
7/16 in. & smaller	33	43
½ in. thru ⅝ in.	26	37
¾ in. to 1½ in. inclusive	18	30

Stove Bolts *Pct Off List*

Packaged, steel, plain finished	44½—10
Packaged, plain finish	25½—10
Bulk, plain finish**	59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger	$8.90
	Pct Off List
7/16 in. and smaller	30

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	40
¾ in. thru 1 in. up to & including 6 in.	26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	43
¾ in. thru 1 in. up to & including 6 in.	33
Milled studs	17
Flat head cap screws, listed sizes	12
Fillister head cap, listed sizes	7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in.	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	23
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25)	$99.30
No. 1 Ohio	92.40
Sec. quality, Pa., Md., Ky., Mo., Ill.	92.40
No. 2 Ohio	83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60)	14.40

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$99.30
Childs, Pa.	103.95
Hays, Pa.	105.10
Chicago District	122.40
Western Utah	116.55
California	122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago	116.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	17.30
Silica cement, net ton, bulk, Hays, Pa.	19.60
Silica cement, net ton, bulk, Emsley, Ala.	18.45
Silica cement, net ton, bulk, Chicago District	18.45
Silica cement, net ton, bulk, Utah and Calif.	25.95

Chrome Brick *Per net ton*

Standard chemically bonded Balt., Chester	$86.00
Burned, Balt., Chester	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., in bulk	38.00
in sacks	43.70

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.75

FLUORSPAR

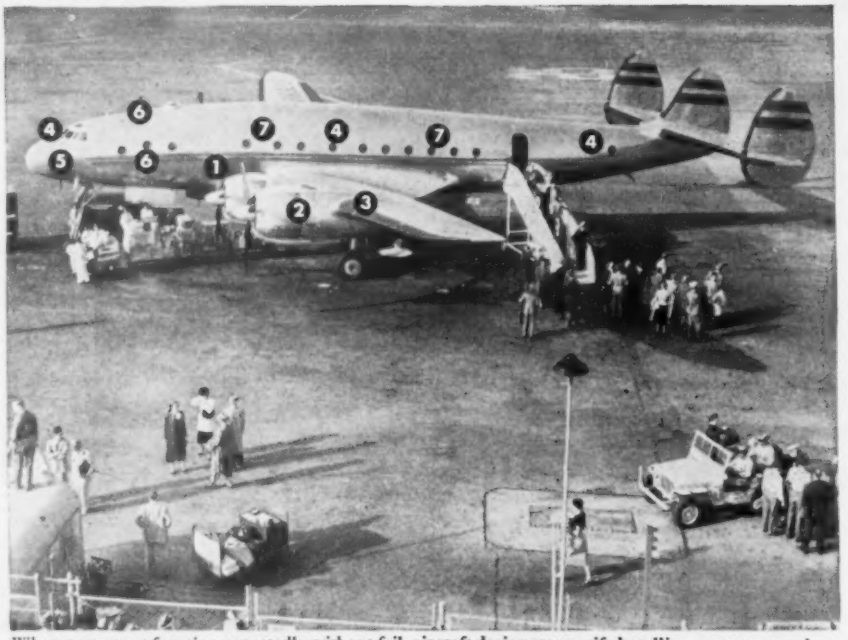
Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

72½%	$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.l.f. New York, ocean bags	10.9¢
Canadian sponge iron, del'd. in East	12.0¢
Domestic sponge iron, 98+% Fe, carloads lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	43.50¢
Copper, reduced	43.50¢
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	21.75¢
Manganese	57.0¢
Molybdenum, 99%	$2 75
Nickel, unannealed	88 0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	33.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.9¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$5.35
Zinc, 10 ton lots	23.0¢ to 30.5¢



When parts must function repeatedly without fail, aircraft designers specify beryllium copper, a unique alloy with a multitude of desirable properties. This Lockheed Constellation serves to show where beryllium copper parts can be found in many modern airliners. For parts, see below.

VERSATILE BERYLLIUM COPPER

The aircraft industry makes wide use of this alloy's ability to do many jobs

In World War II, Berylco beryllium copper was drafted for the production war on many fronts. It did amazingly well. For aircraft, it improved such things as radar equipment, altimeters, valve guides, plug type connectors.

Today Berylco beryllium copper is an engineering material in wide demand—one of growing value to the aircraft industry. It is being used more and more for critical engine parts, from bushings to jet fuel pumps. Its use results in better airframe components as well as more accurate instruments. It helps solve increasingly tough radar and electronics problems.

In fact, nearly every industry today is aware of the part Berylco can play in making better, cheaper products. By offering the designer combinations of such desirable properties as elasticity, fatigue resistance, strength and conductivity, Berylco can often solve design problems involving conflicting requirements. And it can do so at low cost and with the utmost reliability.

The supply picture today is brighter than ever before. Now you can be certain of getting the material you need for *your* application. You can also, for the cost of a phone call, get the know-how and experience of the world's largest producer of beryllium copper. For full information, address your inquiry to THE BERYLLIUM CORPORATION, Dept. 3-G, Reading 6, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper

These Berylco parts—a few of those used in modern planes—are numbered to indicate where they appear in the large photograph. (1) Propeller bolts; (2) fuel injector; (3) de-icing stud; (4) instrument switch part; (5) instrument diaphragm; (6) connectors, plug-type and coaxial; (7) safety belt release.

——Ferroalloy Prices——

(Effective July 21, 1958)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered. 65-72% Cr, 2% max. Si.

0.25% C	34.50	0.20% C	32.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size:

Producing Point	Base Mn Content (Contained Mn)	Cents per lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	76-80%	13.15 (Per lb of alloy)
Etna, Clairton, Pa.	74-76%	10.00
Johnstown, Pa.	74-76%	10.00
Sheridan, Pa.	74-76%	10.00

Add or subtract 0.1¢ for each 1% Mn above or below base content.

Briquets—delivered, 66 pct. Mn.

Carload, bulk	12.50
Ton lots, packed	14.05

pittsburgh ENGINEERING & MACHINE CO.

one of America's leading

STEEL PLANT BUILDERS

A highly skilled ENGINEERING and PRODUCTION Organization. *Backed by years of proven ability*—Ready to work for you . . .

from BLUEPRINTS to PRODUCTION with undivided RESPONSIBILITY

4-HIGH HOT STRIP MILL, DETROIT STEEL CORPORATION, PORTSMOUTH, OHIO
Designers and Builders—Pittsburgh Engineering and Machine Company. *Consult our Engineering Department on any of your plant problems.*

COMPLETE FERROUS and NON-FERROUS PLANTS, complete with special machinery and auxiliary equipment—CASTINGS—OPEN HEARTH and ELECTRIC FURNACE steel from 1 to 200,000 pounds. Produced to most exacting requirements.

Write for free information on your particular problems

pittsburgh ENGINEERING & MACHINE CO.

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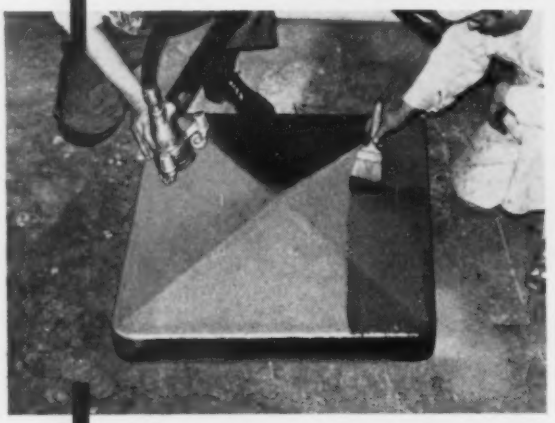
Pittsburgh 22, Pa.
Plant at Glassport, Pa.

DIVISION OF PITTSBURGH STEEL FOUNDRY CORP.

ELIMINATE MAINTENANCE SHUT-DOWNS

with dust-free blast cleaning.



BLAST AND PAINT SIMULTANEOUSLY

Even in the midst of production, VACU-BLASTER removes the most stubborn rust or scale. Surfaces are completely prepared for repainting or other treatment, yet there is no dust or flying abrasives to interfere with plant operation.

Vacu-Blaster's powerful vacuum assures a completely dust-free plant during maintenance operations. Removal, by suction, of all abrasives and cleanings is combined with blast cleaning — the most efficient method to clean rusted and pitted surfaces. Abrasives are separated, then circulated and reused in the blast operation time and again for maximum economy.

VACU-BLAST CLEANING HAS MANY USES

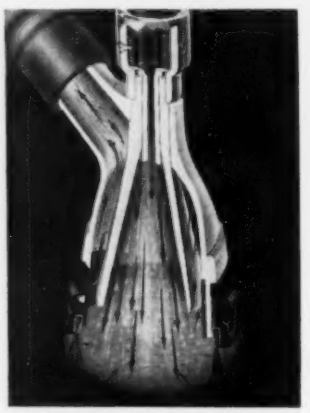
Tanks	Ceilings	Vats
Pipe	Conveyors	Bins
Floors	Hoppers	Containers
Walls	Skips	of all kinds.
	Troughs	

Use VACU-BLASTER on concrete, brick, plastic or metal surfaces. Adjustable for use with all types and sizes of abrasives, from hard steel grit or aluminum oxides to "soft" types such as walnut shells.

FOR SAFE, SANITARY CLEANING

VACU-BLAST is particularly suitable for use in breweries, food or chemical plants and others where sanitation is of the utmost importance. Contamination from flying dust is prevented, plant machinery need not be covered and masks or protective clothing are unnecessary.

Contact your VACU-BLAST Representative or write direct for further information to Dept. H-1308B



THE VACU-BLAST GUN

To blast clean the work surface, the nozzle releases an intense stream of air and abrasive through the center cone of the gun. Used abrasive and dust are sucked up by the vacuum return around the edge of the gun. The surrounding brush prevents dust and dirt from escaping into the plant.

VACU-BLAST CO. INC.

BELMONT • CALIFORNIA

—Ferroalloy Prices—

(Effective July 21, 1955)

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	13.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.65

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
65% Si	13.60	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10-3.20
High speed steel (Primos)	3.20-3.25

NEW

Periodically, new motor-driven washer completely cleans cell plates—re-applies adhesive—by "push-button" operation. Moving nozzles clean thoroughly to full cell depth.

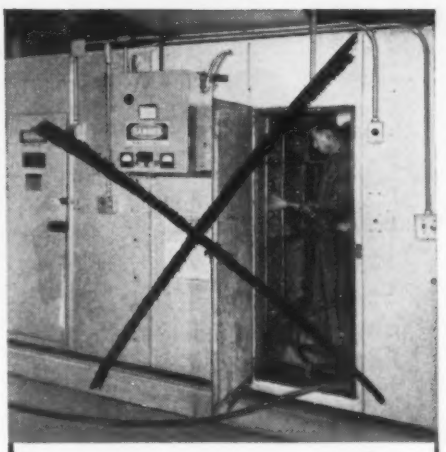
NOW—"PUSH-BUTTON" WASHING FOR ELECTRONIC AIR CLEANER

Now, a new, low-cost, automatic PRECIPITRON® washer cuts maintenance costs and eliminates unpleasant inside-the-duct washing of cells.

This unique device features moving nozzles, making PRECIPITRON the easiest electronic air cleaner to service. After thoroughly cleaning the plates, the washer re-applies adhesive. Entire operation is under "push-button" control. Laboratory and field tests have proved that moving-nozzle washing is a "must" for proper cleaning.

Type PX PRECIPITRON, the electronic air cleaner, traps microscopic airborne particles of dirt, dust, grime and pollen which would pass through conventional filters. It fits into any heating, ventilating or air conditioning ductwork.

Learn how PRECIPITRON will keep the air in your building dirt-free at negligible cost. Call your local Westinghouse-Sturtevant office, or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Massachusetts.



Maintenance men no longer need to enter enclosure to clean PRECIPITRON. New "push-button" feature does away with hot, wet tasks.

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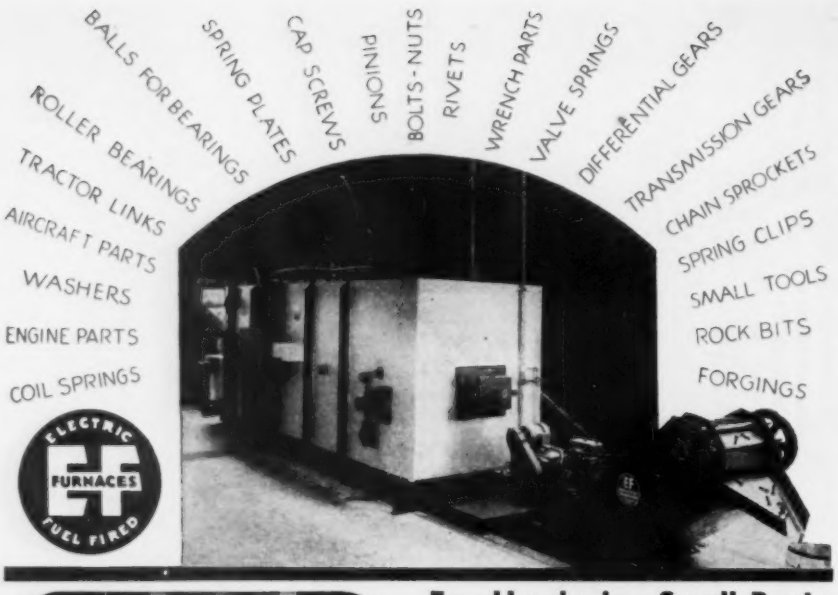
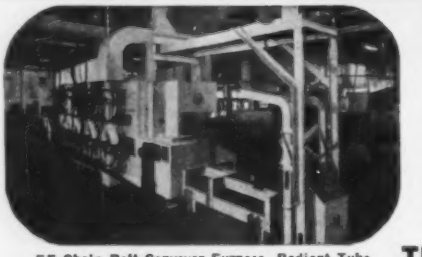
YOU CAN BE SURE ... IF IT'S Westinghouse J-80231





EF Chain Belt Conveyor Furnace, Radiant Tube Gas Heated. Showing Labor Saving Loading Arrangement. (In the view at the top) Electrically Heated Furnace Showing Automatic Quench and Discharge.

For Hardening Small Parts

Uniformly—Scale Free—Continuously

175 to 2000 Lbs. per Hr.

The EF chain belt conveyor furnace is one of the most satisfactory continuous heating units yet devised for scale-free hardening, carbon restoration and non-decarb heat treating small and medium size parts. 11 standard sizes. Capacities to 2000 lbs. or more per hour. Gas, oil or electrically heated. Furnished complete with any desired feeding or discharging equipment. Write for folders describing our chain belt or other production furnaces.

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For Higher Speeds, and Heavier Feeds

ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

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"The Tool Holder People"

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NEW YORK • SAN FRANCISCO

Ferroalloy Prices

(Effective July 21, 1953)

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carloads 9.90
- Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
- Ton lots $6.40
- Less ton lots 6.45

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $4.45

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.12

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk lump ..... 14.50¢
- Ton lots, bulk lump ..... 15.75¢
- Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B... $5.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound.... 50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
- 10 to 14% B..... .85
- 14 to 10% B..... 1.20
- 19% min. B..... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... $1.00
- No. 6 ..... 68¢
- No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
- Ton lots $1.46
- Less ton lots 1.57

Nickel - Boron, 15-18%, B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered $2.05
Less ton lots .....

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

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36" x 12' centers AMERICAN Heavy Duty 16 Speed Geared Head Lathe, AC-MD
42" x 96" centers NILES Timesaver Heavy Duty Lathe, 42" swing over ways, rapid traverse, anti-friction head, AC-MD
60" x 20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse
62" BULLARD Vertical Boring Mill, 2 swivel rail heads, power rapid traverse, AC-MD
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No. 2 CINCINNATI Vertical Mill, dial type, new 1945
No. 3 ROCKFORD Combination Vertical & Horizontal Mill, 10 HP, AC-MD
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NEWS OF USED AND REBUILT MACHINERY

Doubts on Auctions . . . Despite reports that auctions are drawing an increasing number of used machine tool men in other areas, Chicago dealers remain skeptical about their chances of being able to pick up good equipment at public sales.

It's true that there are larger turnouts at used machinery auctions than at the beginning of the year, but most dealers in the Chicago area still feel that any new tools put up on the auction block will command prices well above what they have any intention of paying.

Watch Prices Drop . . . Despite this reluctance to buy, some dealers anticipate a business pickup near the end of the third quarter. They say the recent increase in sales of older model used machine tools is causing prices of newer equipment to drop, and as a result dealers are content to stand pat with slim inventories of late model units until prices hit bottom.

Dealers report the downward price trend is stimulating business volume to a certain extent. With prices falling, a number of small and medium-sized industrial firms have come back into the market, particularly since their own sales of finished goods have continued to hold up well so far this year.

Pressure on Rebuilders . . . As in other markets, many firms in the Chicago area are hunting for bargains in late model used machinery but aren't as yet able to get the kinds of deals they are hoping for.

Another result of the price drop has been increased pressure on rebuilders. Forced to buy late model tools, rebuilders are finding that their customers are balking at current prices.

Backlogs in this field have been falling off, and with current defense cutbacks spreading throughout the aircraft and ordnance programs, their defense business continues to be unhealthy.

Currently, demand for milling machines, planers, and a few types of lathes is fairly good, and in the older age groups there has been some movement of light shop equipment. Movement of sheet metalworking equipment has been falling off somewhat after being strong through the first quarter and moderately active in the second.

Inquiries Are Off . . . In the Philadelphia area, dealers report demand for good used equipment is fairly strong from civilian goods producers, but prices are high and inquiries seem to have been slipping lately.

Used machinery firms report there has been greater demand for lathes recently and say there is interest in most types of general purpose equipment. There is little demand for special types of machine tools, but the market for milling machines and radial drills is good, though these units are extremely scarce.

Prices Falling . . . General feeling in the Philadelphia area is that the used machinery business is getting back to normal, though dealers are not quite sure what "normal" is. In Philadelphia as in Chicago, dealers report prices on used machinery are coming down. The decline is slow, however, and there will have to be more of a drop before business improves noticeably. In addition, more machinery will have to be placed on the market, particularly heavy equipment which is currently scarce. Expectations are that prices will continue to slip and that machinery will become more readily available sometime this Fall.

Used tool men say there has been a definite downtrend in subcontracting and that several small shops have sold out and others are currently in the process of doing so.